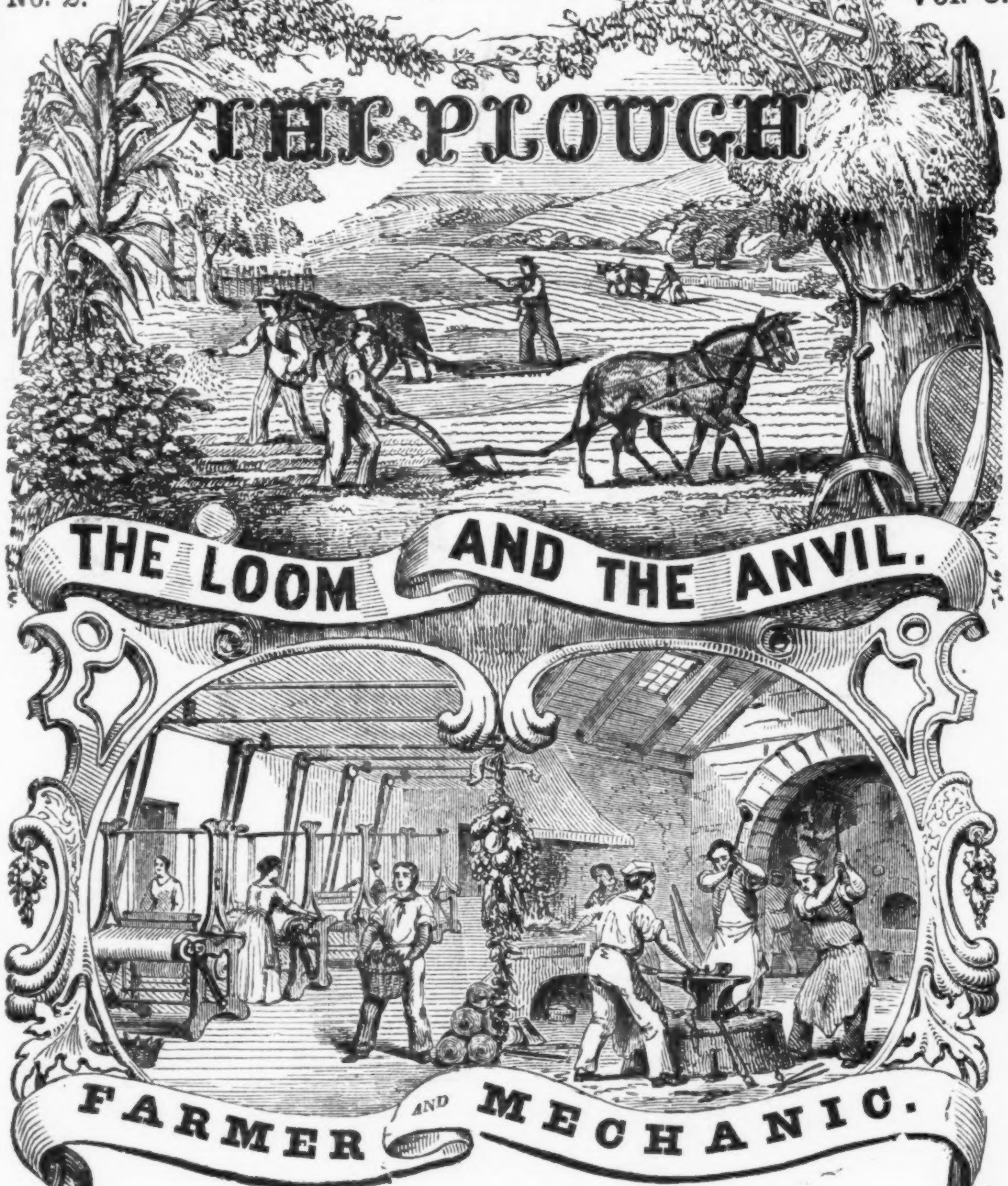
No. 2. August, 1855. Vol. 8.



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The Plough, the Loom, and the Anvil.

Vol. VIII. AUGUST, 1855. No. 2.

GREAT TELEGRAPH ENTERPRISE.

The sciences are mutual commentators on each other. Every new discovery, in any department, tends to elucidate or correct previously-existing theories in some collateral science. So it is in the practical application of science or mechanics. Every step gained throws increased light over the horizon. The knowledge of forces, projectiles, etc., affects and modifies the forms and methods of promoting locomotion of merchandise and of persons. Improvements in this leads the way to railroads. These opened new trades, and greatly increased the traffic in merchandise already established. The telegraph is invented, and instantaneous communication is opened from the extremes of a continent, dispensing with much of the older forms of correspondence. But this is not the final result. There is no such thing as *final result* in scientific attainments, or in their practical applications. The next movement is, continents are united, and already there is electric communication between London and the Crimea. Even this is not enough. Now the great ocean must be crossed by these eloquent wires. Man not only says to the ocean, bear up for us our rich freights, and to the winds send them to distant countries, but it now says to the wind we need not your aid in this work. There is a power at our command, wrapt up and asleep in a cask of fresh water, far more serviceable than your fickle breezes. And today he is ready to say, even to the wide and pathless ocean, you can form no barrier to our constant and instantaneous communication with the other side of the flood. We can hear what is hourly transpiring in the old world, notwithstanding the thunder of your mighty roar. You cannot drown the small voice of the telegraph. But we are running wild. We pass at once to the simple narrative of what is done, or is doing, in the great enterprise.

For a year past notices have occasionally appeared in the papers of a company formed in this city to carry a telegraph across the ocean. But the project seemed so wild and visionary that few believed it would be seriously attempted. The design was vast and grand, no doubt, but it was impracticable. Many even doubted the existence of such a company. They thought it all a hoax, and others, when assured of the fact, shook their heads and uttered wise remarks on the transparent folly of sinking money to the bottom of the ocean. It was literally throwing it into the sea. We are at length enabled to remove all mystery from the matter, and to state on the best authority what plans have been formed, and how far they are advanced toward accomplishment. A little more than one year ago a few individuals formed the daring project of carrying into execution this dream of science—this

scheme which sanguine spirits had hoped for, but few believed possible. Their first step was to obtain a charter from Newfoundland. For this purpose three of their number were dispatched to St. John's, where, after weeks of negotiation with the Government, they succeeded in obtaining from the Province an *exclusive* charter for fifty years to build a telegraph to or across the island or the waters adjacent thereto or any of its dependencies. As Labrador is one of these, this charter virtually gives them the whole range of the continent. Further to encourage the enterprise, the Government agreed to pay £5000 towards constructing a bridle-path across the islands, which was necessary for the use of the telegraph, and to guarantee the interest on £50,000 for twenty years, and also to give fifty square miles of land, to be selected anywhere on the island—all this on its completion to St. John's; to which were to be added fifty more square miles of land if it should be carried across the Atlantic.

They obtained also from Prince Edward's Island an exclusive charter for fifty years. This Province gave 1000 acres of land. At the same time, to complete their right of way, they purchased a charter which had been previously obtained in New-Brunswick, and have since obtained one from Canada, with full liberty to cross their territory at any point that should be necessary. They also made a valuable agreement with Prof. Morse for the use of his patents and all renewals. This gentleman, who is the highest authority on the subject in the world, was sanguine of the success of the enterprise, and soon became personally connected with it. The Company was formally organized in May, 1854, by the choice of Peter Cooper, Marshall O. Roberts, Cyrus W. Field, and Chandler White, Esqrs., as Directors. Peter Cooper was chosen President; Moses Taylor, Treasurer, and Professor Morse, Electrician. From these names it will be seen that the business is in the hands of men who, to say the least, are not generally regarded as visionary, but as those who look far ahead and are apt to carry through what they have once begun.

The Company immediately commenced operations. They at once purchased the steamer Victoria, and sent her to Newfoundland with an engineer and assistants. A road was to be cut across the whole extent of the island, four hundred miles, through a wilderness seldom trodden by man. In this work about six hundred men were employed the whole of the season. It now appeared that the Government of Newfoundland, while granting a charter most liberal and honorable to themselves, had yet acted wisely for the interests of their own Province. A new spring was given to industry, treasures were found which before were not known to exist. Last summer the Company employed three mineralogists to explore the country, who discovered two mines of coal, one of copper, one of lead, and also quarries of slate and alabaster, and very valuable traces of ship-timber. This will develop rapidly the trade of the island, which before has been confined almost wholly to its fisheries.

So far all went well. The work was begun and advancing successfully. Less than a hundred miles of submarine cable were needed to stretch across to Cape Breton, and when this was laid and the line completed to St. John's, there would be direct telegraphic communication east from New-York about twelve hundred miles. This certainly was a long stride toward Europe. But now came the great difficulty. They had reached the rocks of Newfoundland, but there before them was the mighty ocean, raging wildly around those cliffs, as untamed as when Columbus first crossed the sea. To advance into these deep waters was the next and the perilous step. Proposals had

been received from a European company to unite with them in the enterprise, and in January last one of the directors sailed for England to complete the negotiations.

In this he was entirely successful. In London he formed a contract with the Transatlantic Telegraph Company, composed of English and French capitalists, whereby the latter engaged to construct and lay down, at their own expense and risk, a submarine cable extending from Ireland to St. John's, Newfoundland, and to have it completed on or before the 22d day of January, 1858. The two companies, European and American, each will own the line which it constructs, but their contract obliges them to operate in connection with each other, to the exclusion of all other lines, for the period of fifty years, which is the limit of the American company's charter.

At the same time, a favorable contract was made for the submarine cable to connect Newfoundland with Cape Breton. This will be seventy-four miles long, and is to be ready on the last day of this month, when it will be shipped direct to Newfoundland. The steamer Victoria sailed a few days since for St. John's, with Mr. Ellis, the chief engineer, and his assistants. The company confidentially expect to have telegraphic communication established between New-York and St. John's in the course of this summer. All the necessary harbor and wharf accommodations have been secured at that port for the steamers which are expected to call there on their trips between America and Europe. St. John's is about two days nearer to England than Halifax. We have therefore every reason to believe that in three months the old world and the new will be within a week's hail of each other—and that within three years the two hemispheres will be in instantaneous communication.

We are aware that some will read this with a smile of incredulity. All the contracts in the world will not convince them that such a work will ever be achieved. Though the bond be sealed, signed, and delivered, yet neither Englishmen nor Americans can do what is beyond all human power. To these evil prophets we may add a word to show that the enterprise is not so impossible as they are wont to believe. The first thing to be noted is the bed of the ocean along the track of the proposed route. Says Lieut. Maury: "There is at the bottom of the sea between Cape Race in Newfoundland and Cape Clear in Ireland, a remarkable steppe, which is already known as the Telegraphic plateau. The great circle distance between these two shore lines is 1600 miles, and the sea along this route is probably nowhere more than 10,000 feet deep." That is not too deep to be reached by the cable sunk in the waters, and yet deep enough to be out of the way of anchors and icebergs. This seems like a special provision of nature to favor this great work. A chain of uplands lies under the sea as if on purpose to bear up the chain of intelligence across the deep. On that broad plateau is to be laid this mighty coil—this serpent winding around the earth, and pressing it together in its folds. The bottom of the sea is found to be not sharp rock nor precipice, but soft, shelly sand, into which the telegraphic line may sink and become imbedded for ages.

Next as to the material employed. To speak of a *wire* would convey a false idea. For though there are several small copper wires, these are encased in gutta-percha, and around them is wound a coil of heavy wire, forming altogether a huge iron cable, strong enough to hold fast any ship-of-war in the world. We have at our office specimens of that used under the British Channel and under the Mediterranean. The cable purchased for the line from Cape Breton to Newfoundland weighs over five tons to the mile, and that to cross the Atlantic will be much stronger.

But the most triumphant proof that this thing is possible, is the fact that *it has been done.* A telegraph has been in operation four years from England to France. Others stretch to Belgium and Holland. The last steamer brought news that a line of 500 miles has just been laid under the Black Sea, by which the Crimea is brought into hourly communication with London. Another is now being laid from France to the Island of Sardinia, and thence across to Algeria. The man who has achieved the greatest of these triumphs is Mr. John W. Brett, of London. This gentleman is now interested in the Transatlantic Telegraph Company, and undertakes to belt the ocean. With a full knowledge of the immense labor and cost, and of all hazards, he still dares to promise to bind the Atlantic, as he has already bound the Mediterranean.

Nor is the difficulty greatly increased by the length of the line. Doubts have been expressed whether an electric current could be sent such a distance. It was said it would not go more than five or six hundred miles, and projects were devised for carrying a telegraph around by way of Greenland and Iceland. But these doubts are now set at rest by recent experiments of Prof. Faraday. He declares the thing perfectly practicable. The only drawback to his happiness in the discovery was that it would occupy an appreciable time in the passage. He seemed in this a little disappointed. When asked "how long it would take to pass from London to New-York?" he answered, "possibly one second." This is not quite as quick as we expected, but on the whole we think that will do!

MAGNIFICENT FARMING.

The following very interesting account of the large and excellent farm of John Sigerson & Brother, near St. Louis, is copied from the *Valley Farmer.* There are much larger farms in the Union, but none, perhaps, where there is so profitable a combination of diversified crops—and the enterprise and energy of the Sigersons are worthy of imitation.

The Sigerson farm is situated south of the River de Peres, in what is known as the Carondelet Common Fields, and consists of one thousand acres, all under fence and nearly all in cultivation. When the commencement was made there, about ten years ago, the whole tract was covered with a stout growth of black jack, hickory, hazel, etc. The Gravois runs through the entire tract, diagonally from south-east to north-west, affording abundance of water for stock. The ground is quite undulating, and on it are found numerous sink-holes through which the water drains off by subterranean passages in the limestone ledge which underlies the whole section into the Mississippi river. The soil is a rich, sandy loam, very deep, upon a clay sub-soil, and on being worked becomes very friable, and is easily pulverized. It is admirably adapted to the growth of fruit, and also, corn, wheat, potatoes—in fact everything cultivated in this region.

They have now an apple and peach orchard in bearing, of over 160 acres, embracing some 40,000 trees; they have 5,000 pear trees in bearing, besides nectarines, apricots, cherries, plums, quinces, etc., in great numbers. They have 200 acres of meadow, 60 acres of wheat, the finest we have seen this season; 60 acres of oats; 100 acres devoted to the nursery, in which they

have this year planted about five bushels of apple seeds, and thirty bushels of peach stones; they have in it 50,000 budded peach trees, which will be ready for sale this fall; a larger quantity of apples; 300,000 grape cuttings; 30,000 evergreens, besides large quantities of quinces, pears, etc., as well as ornamental and shade trees, roses, dahlias, and every variety of hardy and exotic flower and shrub. They have twenty-five acres of strawberries, from which they have daily gathered from one to two hundred gallons of strawberries for two weeks past.

Besides supplying a large amount of food for the St. Louis market, the Messrs. Sigerson are intending this year to send large quantities to Chicago, Milwaukie, Galena and other cities north of us. By our railroad facilities this can now be accomplished so as to contribute vastly to the comfort of our northern neighbors, and be a source of profit to the enterprising men engaged in it. They expect to have from twenty to thirty thousand bushels of peaches to dispose of this season.

The force employed to carry on this vast concern, varies, according to the season, from thirty to fifty men. They have residing on their place about eight men who have families, to whom they furnish a comfortable home, a garden plat, fire-wood, pasturage for a cow, and pay them twenty dollars per month, the men boarding themselves. Single men are boarded by the proprietors, and paid from twelve to fifteen dollars per month.

We were much interested in the appearance of the giant growth of wheat in the midst of large trees; in the natural blue grass pasture; the nine miles of Osage Orange hedge, most of it a perfect barrier to all kinds of intruders; the magnificent evergreen hedge; the luxuriant clover, and above all, the neatness and order characterizing the whole concern, in which respect a vast improvement has been made since our previous visits. Nor ought we to omit to mention the valuable stock belonging to the farm. We particularly noticed four two year's old heifers brought from Kentucky—animals that cannot easily be beaten, also a pair of mares heavy with foal, which were really splendid animals. We noticed many other fine animals, which we cannot particularize.

The Sigersons are firm believers in the efficacy of deep ploughing and thorough cultivation, and act upon the principle that whatever is worth doing at all, is worth doing well; accordingly they put the plough down to its beam, and frequently put in the spade so as to pulverize fully two feet deep. The weeds are also, we notice, kept in subjection.

The success of this enterprise, so highly creditable to the proprietors, and of which our city and State have just cause to be pround, has demonstrated one thing from which the people of both the north and the south should receive instruction. It is often said by over-zealous persons at the north, who know but little about the actual condition of things in the Slave States, that white laborers cannot live in a slave community; that the tendency of the institution of slavery is to drive away all intelligent free laborers, etc., etc.; yet here is, in a Slave State, the largest farm in the Union, and one which is making more money for its owners than any other, operated entirely by free labor, there never having been a slave employed on the place, and a better, more respectable and intelligent set of men cannot be found employed in any place in the Union.

One thing more we would notice in concluding our remarks upon this establishment, and that is over the entrance gate to the place, is placed a sign to the effect that *no business visitors are admitted on the Sabbath.* The Scripture says, "They that honor me I will honor."

Mr. H. F. French gives the following account in the *New-England Farmer* of the Farm of Mr. Darius Claggett:

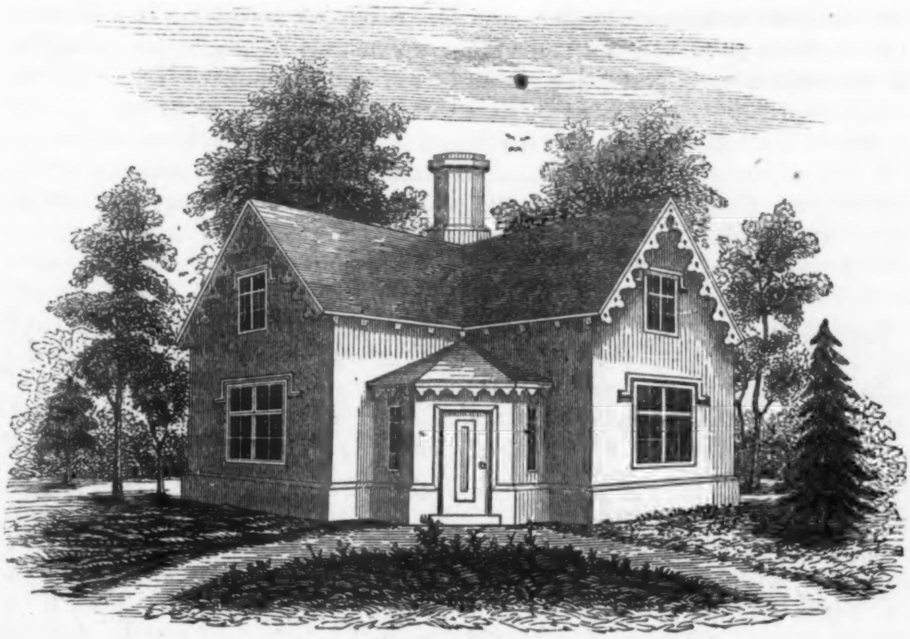
Good husbandry and energetic farming are not limited to New-England men. I yesterday accepted an invitation from a leading merchant of this city, Mr. Darius Claggett, to visit his farm on the Rockville plank-road, about five miles from Washington. His family reside on the farm in summer, and Mr. Claggett himself comes to his city business every day except Sunday and Friday.

I have rarely seen a place which gave so decided evidence of good taste and good judgment, and withal, of such preserving faith in our good mother earth, as this. Six years ago Mr. Claggett purchased three hundred acres of land, mostly covered with a small growth of yellow pine, entirely unimproved. In this short period of time he has cleared and put under the plough one hundred and fifty acres, a large part of which is covered with a choice variety of fruit trees of all descriptions that the climate will produce. His trees appear to be judiciously selected, carefully pruned and protected, and making a growth far beyond what I have ever seen at the North. He has already 2500 apple trees, 450 pears, 1600 peaches, 150 apricots, and as many plums.

The apple trees are set forty feet apart, and the land among them planted with wheat in drills, with bare strips of a few feet in width along the rows. They are making generally a better growth than we get in New-Hampshire. I saw upon them marks of our old enemy, the borer, and far worse marks of the seventeen-year-locusts of 1852. According to the theory, they will not be here again until 1869, by which time our friend will, it is hoped, have been paid by the fruit of his trees for all his labors. He said that when the locusts had possession of his trees, he could scrape from the body of a newly-set apple tree a pint of the insects at once! His pear trees, however, far excel his apples. Indeed, I have never seen so large a number of pears together that appeared so healthy, as we say at home, so *thrifty* as these. I saw no signs of the sap-blight or winter-killing, but the trees seemed full of life, and many of them were full of fruit already set. The peach orchard is already set for a large crop. In 1853, Mr. C. sent to the market 700 baskets of peaches, and his crop this year will probably far exceed that quantity. He has this year in grass, about 20 acres, in wheat about the same, in corn about 40 acres, and in potatoes about 12 acres, besides large tracts of vegetables and small fruits, among the rest two acres of strawberries. He manures all his crops with Peruvian guano, 300 pounds to the acre, ploughed in, and thinks this will insure him abundant crops.

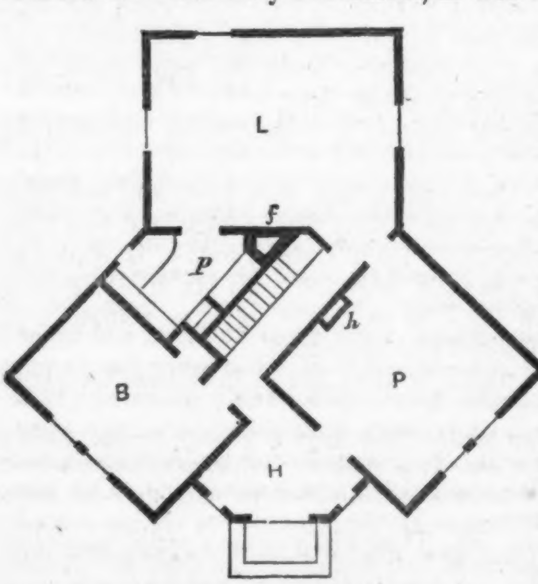
Mr. Claggett has been for thirty years in his counting-room, and never owned a farm before. Indeed he informed me that he never saw a plough run in his life until he saw his own, on this farm. His labor is performed by a foreman, a native of the district, and six laborers, mostly Irish, with two yoke of oxen and three horses, a force by the way, entirely insufficient to perform such mighty works on New-England soil. I did not see the foreman, but cannot help suspecting that he is a farmer of the right stamp. I have good faith in the success of any intelligent man who will read and inquire, and spend his money freely that he may produce satisfactory results in agriculture. Still it is a business not learned in a day, and I have no reason to doubt the correctness of our friend's remark, that "Farmer Claggett owes merchant Claggett a good deal of money,"

Such men, however, are public benefactors. They inspire others with faith in labor, and faith in the heritage which a good God has given us, and if they expend money in the experiments, they derive from them the rational satisfaction that they leave the earth better than they found it.



PLAN OF A FARM COTTAGE.

THE rooms in this plan for a small farm-house are of the most common description, to wit: a parlor, a living-room or kitchen, a pantry, and a bed-room, on the first floor; and three bed-rooms, with closets, on the second. Although uncommon in its form and arrangement, this cottage is thought to be more than ordinarily convenient, as well as unique in expression.



GROUND PLAN.

H, hall or entrance; P, parlor; L, living-room or kitchen; B, bed-room: *P*, pantry, with shelves; *f*, principal chimney; *h*, parlor chimney.

In this design the parlor is 13½ feet square, inside measure; the kitchen, 13½ by 16½; the bed-room, which has a small closet, 13½ by 9; the pantry, 6½ by 8½; the hall or entrance, 7½ square; the passage, 2 feet 8 inches wide, and the stairs 2 feet 3 inches. The bed-rooms in the second story are of the same size as the three lower ooms, and directly over them. The space over the pantry affords room for two good-sized closets. The parlor chimney ascends only to the chamber floor, and a pipe runs from it across the passage to the main chimney. The rear gable is of the same height as the two front ones, but the roof is less steep, inasmuch as the back part is wider than the front parts. The wood-house should stand 20 feet in the rear of the building.

The cost of materials and labor vary so much in different locations that it

seems needless to attempt giving an estimate of the expense. It will vary, however, from $500 to $800, depending upon style of finish, cost of material, etc., and is therefore within the means of all.—*Gen. Farmer.*

ENTOMOLOGY.

The number of insects, worms, etc., which are either annoying to the person, or injurious to our crops, is very large. The former are the less important, a little skill only being necessary to protect us in a great measure from such annoyance; or if wounded, appliances are at hand to diminish or eradicate the disease they may produce. But with our fruits and vegetable crops of many kinds, the proper treatment in the way of prevention is absolutely essential. Yet this is a branch of science about which our farmers and mechanics and professional men alike are eminently ignorant. Many are acquainted with flowers, both wild and exotic, and cultivate fruits extensively, who know nothing of the animals or insects that infest and destroy them. Cut-worms, wire-worms, etc., eat off the young corn, or devour its tender leaf; the borer pierces your apple or peach-tree, or plum-tree; while the caterpillar comes in throngs and devours all before it. The curculio destroys the young fruit; green lice, or aphides, cover the tender branches of choice roses, geraniums, and other flowers, so that they wither and die. Nor will they suffer your shrubs, nor the leaves of your trees to grow and flourish, if they obtain an undisturbed possession.

We purpose, in this and other essays, to throw a little light upon this subject, and hope to give such illustrations of the more destructive species, and shall lead the laborer or amateur agriculturist to detect and know them, and apply such means for their destruction as are at hand.

First, let us describe the general classes in which these animals are arranged.

I. Coleoptera; or *Beetles*. These are insects with jaws, and two thick wing-covers meeting in a straight line on the top of the back, and two filmy wings, which are folded transversely. Their transformation is complete. Their larvæ,* called grubs, are generally provided with six true legs, and sometimes with a terminal prop leg. More rarely they are without legs. The pupæ have wings and legs distinct and unconfined.

Of this order many species are useful, as they live upon caterpillars, plant-

* Larvæ (singular *larva*) are insects in their first stage or infancy, formed directly from the egg. The word signifies a mask. It is applied to all insects that undergo a complete transformation, to all young and wingless grasshoppers, and to all young insects before the wings begin to appear.

A pupa is the second stage of insect life. Those that undergo a partial transformation retain their activity and their appetite for food, and grow and acquire the rudiments of wings. Others, at this age, entirely lose their larva form, and take no food, but remain at rest, in a deathlike torpor. This is the pupa state.

The pupæ from caterpillars are generally called chrysales or chrysalids, on account of their having shining spots upon them. Grubs, after their first transformation, are sometimes called nymphs.

In most young insects, or larvæ, the body consists of a head and a series of twelve rings or segments, the thorax not being distinctly separated from the hinder parts of the body or abdomen, as in the adult form.

lice, or other noxious insects. Such are the Water Lovers, Rove-beetles, Carrion-beetles, Skin-beetles, Bone-beetles, various kinds of Dung-beetles, etc., which act as scavengers. Stag-beetles, Many Bark-beetles, and Spring-beetles live under the bark or in the interior of decayed trees, and are therefore harmless, if not positively useful in hastening a process which is inevitable, and the better, of course, the more rapid.

II. ORTHOPTERA. This order includes *Crickets, Cockroaches, Grasshoppers*, etc. They have jaws, two thick opaque upper wings, overlapping a little on the back, and two larger thin wings which are folded in plaits like a fan. Their transformation is partial. The larvæ and pupæ are active, but without wings. All of this order, except camel crickets, which prey on other insects, are injurious to our household goods or to vegetation.

III. HEMOPTERA. In this order are included *Bugs, Locusts, Plant-lice*, etc. These insects are provided with a horny beak for suction, four wings, the uppermost generally thick at the base, with thinner extremities, which lie flat and cross each other on the top of the back, or are of uniform thickness throughout, and slope at the sides like a roof. Their transformation is partial. The larvæ and pupæ are nearly like the adult insect, but without wings.

IV. NEUROPTERA; *Dragon flies, Lace Winged flies, Ant-lions, Day-flies, May-flies, White Ants*, etc. These are insects with jaws, four netted wings, of which the hinder are the largest, without stings or piercers. Their transformation is complete or partial. Larvæ and pupæ are various. Of this order, Dragon flies (Libelluladæ) prey upon gnats and mosquitoes; others devour aquatic insects.

V. LEPIDOPTERA; *Butterflies and Moths*. These have a mouth with a spiral sucking tube, wings four-covered with branny scales. Transformation complete. The larvæ are caterpillars, and have six free legs, and from four to ten fleshy prop legs. Pupæ, with the cases of the wings and of the legs indistinct and soldered to the breast.

Some kinds of caterpillars are very troublesome in our houses, destroying woollens, furs, feathers, wax, etc., etc.; but most of them live on vegetable food, and are destructive to buds, flowers, leaves, stems, fruit, seeds, pith, and roots of plants.

VI. HYMENOPTERA; *Ants, Bees, Saw-flies, Wasps, etc.* This order consists of insects with jaws, wings 4-veined in most species, the hinder pair being shorter than the others, having a sting or piercer at the extremity of the abdomen. Their transformation is complete. The larvæ are mostly maggot-like or slug-like, but some are caterpillar-like. Their pupæ have legs and wings unconfined.

VII. DIPTERA; *Mosquitoes, Gnats, Flies, etc.* These insects have a horny or fleshy proboscis, two wings only, and two knobbed threads called balancers or poisers behind the wings. Their transformation is complete. The larvæ are maggots without feet, and with breathing-holes generally in the hinder extremity of the body. Pupæ mostly encased in the dried skin of the larvæ, sometimes, however, naked, in which case the wings and legs are visible, and are more or less unconfined.

Besides these seven orders, which are generally adopted by naturalists, are several smaller groups, not arranged in any order. There is not entire uniformity, however, among learned writers on this subject. The flea tribe was placed among the bugs by Fabricius, and forms the order Aptera of Leach, Siphonaptera of Latreille, and Aphaniptera of Kirby. They are destitute of wings, and have four little scales pressing close against the body. Their

mouth is fitted for suction, and with lancet-like piercers for making punctures. They undergo a complete transformation. Their larvæ are worm-like and without feet. Their pupæ have their legs free. Besides these are many others, not generally classified in orders, of some of which we shall treat hereafter.

The number of species of insects is very large. Four thousand species of weevil have been scientifically described and named, but they are all arranged in 350 genera. Some have judged that there are six insects to every plant. Harris says that four to one is within bounds.

The following extract from the recent work of Dr. Emmons illustrates the great importance of a general knowledge of this subject:

"A thick foliage of a fine avenue of poplar was all at once attacked by an immense quantity of caterpillars of *Bombax dispar*. I thought of giving them the *calosoma sycophanta* for company; as, like them, it passes its life upon the trees, feeding upon the caterpillars which it meets, and even deposits its eggs in their nests, that its voracious progeny may procure nourishment more easily and in greater abundance. Well! this insect multiplied itself with a rapidity truly astonishing; and the caterpillars disappeared, without those who were witnesses to the destruction having the least idea of the causes which produced it. M. Boisgiraud then gives it as his opinion, that the neighborhood of the city of Toulouse is so little ravaged by the *Melolontha vulgaris* which is so destructive in other parts of France, because the *Carabus auratus* seizes and devours the *Melolontha* previous to the deposition of its eggs; and that it is more fond of these than of any part of the insect. You see, then, that it is indispensable to study the manners and habits of destructive insects, that their instinct and address may be successfully employed for the destruction of the species able to do us injury. Then in place of barbarously crushing the useful species which have the misfortune to be not always ornamented with the rich colors of the butterfly or the *Buprestis*, we will endeavor to protect them and propagate their race. We will find auxiliaries in them the more valuable, as they increase with our adversaries, and as they alone are able to rival the cunning of these ingenious enemies."

The *Melolontha* here spoken of is a destructive family, called *Melolonnadæ* or *Melolonthians*. Its popular name is the common *Cock-chaffer* of Europe. The female lays its eggs, a hundred or more in number, in the earth, at a depth of five inches or more, and then ascends, and, like most insects, soon perishes. The little white grubs hatch in fourteen days. They have six legs near the head, and a mouth provided with strong jaws. When at rest, they curl themselves in the form of a crescent. They subsist on tender roots of various plants, and often commit the most deplorable ravages. During the summer they live near the surface; but as winter approaches, they descend below the reach of frost, and remain torpid till spring. They then change their coats, and ascend to the surface for food. After three or four summers, they cease eating, penetrate about two feet into the earth, and by peculiar motions they form an oval cavity, line it with a glutinous substance, and, throwing off their skin, become pupæ. In this state the legs, wing-cases, and antennæ of the future beetle are visible through the transparent skin. In February this skin is rent, and in May the perfect beetle digs its way to the surface. These grubs are very destructive. They sometimes devour the roots of whole acres of grass, or of wheat or other grains. The May bugs, as they are called, pass the day among the trees, and at night fly about and, attracted by lights, enter houses, moving very irregularly, and hitting against objects

that are in their way, and often fall to the ground. Hence the phrase, "as blind as a beetle."

Among the many species of the first order, (COLEOPTERA.)

The Scarabæidæ are distinguished by short moveable horns or antennæ, ending with a knob, the projecting ridge of the forehead extending more or less over the face like the visor of a cap, beneath which the antennæ are planted.

Areoda Lanigera, or woolly areoda, or Goldsmith Beetle. This is nine-tenths of an inch long, lemon-yellow above, glitters like burnished gold on the top of the head and thorax, under side of body copper colored and thickly covered with whitish wool. Legs brownish yellow, or brassy, shaded with green. Morning and evening after the middle of May, till the 20th of June, they fly about, with a humming rustling noise, among the trees, the young leaves of which they devour. Pear trees are specially subject to their attacks, though they do not spare the elm, poplar, oak, hickory, and other trees. They remain at rest during the day, secreted often between two or three leaves, which they draw together and confine by their claws. They cleave to the under side of the leaf.

When the tree is shaken they fall to the ground, without attempting to fly.

Our May beetle is of another species from the European. It is the *Phyllophaga quercina* of Knoch. It is a chestnut-brown, smooth, with fine punctures or dots. Each wing-case has two or three slightly elevated long itudinal lines. The breast is covered with a yellowish down. The knob of its antennæ contains only three leaf-like joints. Its average length is nine tenths of an inch.

The grub is a white worm, with a brownish head, and, when fully grown, is nearly as thick as the little finger.

A grub is frequently found under old dung-heaps, commonly called the muck-worm. This is the dung-beetle, and is called by Mr. Say, *Scarabæus relictus.*

The *Phyllophaga fraterna*, or leaf-eater, is smaller and more slender. The punctures are less distinct, and the three elevated lines are scarcely visible. Its length is thirteen twentieths of an inch. Its habits, like those of the preceding. It is seen in June and July.

The *Phyllophaga hirticula* is of a brown color, its punctures larger than in the preceding, and on each wing-cover are three longitudinal rows of short, yellowish hairs. Length, seven tenths of an inch. Seen in June and July.

Phyllophaga Georgicana, or Georgian Leaf-eater. This species is bay-brown, entirely covered on the upper side with very short yellowish grey hairs, its length seven-tenths of an inch.

Phyllophaga Pilosicollis (of Knoch) is a smaller chafer, ochre-yellow, with a very hairy thorax. It is often thrown out of the ground in early spring by the spade, but does not ascend voluntarily till the middle of May; length half an inch.

All these are found in nurseries, orchards, and gardens, and are injurious.

Omaloplia Vespertina (of Gyllenhal, and *Sericea* of Illiger,) attacks the leaves of the sweet-briar, on which they may be found in the evening, about the last of June, in greater numbers. They resemble May beetles in form, but are shorter, and smaller in size, and thicker in proportion to the length. The Vespertina is a bay-brown; wing-covers marked with many longitudinal shallow furrows, which with the thorax, are thickly punctured; three-tenths or four-tenths of an inch in length.

Omaloplia Sericea, or Silky Omalophia. A deep chestnut brown, irridescent or changeable, reflecting the colors of the rainbow. In other respect it resembles the preceding, in appearance and habits.

Pelidnota punctata, or spotted pelidnota. This is found on grape vines, both wild and cultivated, in July and August. They are oblong, ovate, about one inch long. Their wing-covers are tile-colored, or a dull brownish yellow, and having three black dots on each. The thorax is darker, with a black dot on each side. The body beneath, and the legs, are a deep bronze-green color.

The leaves of the grape-vine are their only food. They fly by day.

The only method of destroying them is to pick them off with the hand and crush them. Their larvæ live on rotten wood.

The natural enemies of the beetle, which materially check its ravages, are the badger, the weasel, the marten, skunk, bats, rats, dunghill fowls, night-hawks, and crows. The common jay devours them, feeding each of their young with fifteen or twenty every day, and devouring some fifty themselves, when fully grown.

The number of beetles may be materially diminished by shaking the trees every morning or evening. The morning is the best time, as they will not then attempt to fly. Sometimes two bushels have been collected on a sheet in a single experiment. They may be thrown into boiling water, and then fed to swine.

THE CENSUS OF CLINTON.

"The harmony of interests" among all trades, which we so constantly enforce, is obvious in the following statistics of this young but thriving community. Our readers will remember it as the location of the manufacturing establishments originated by the eminent inventor, E. B. Bigelow, Esq.

"The whole population of Clinton on the first of June last, was 3644. Of this number 1470 are males, and 2174 females. The nativities of the inhabitants are found to be as follows, viz.: 2283 are natives of the United States, and 1361 of other countries. Of the natives, Massachusetts furnishes 1582; New Hampshire, 236; Vermont, 153; Maine, 104; New-York, 63, and other States, 162. Of the foreigners, Ireland furnishes 966; Scotland, 107; England, 72; Germany, 69; British Provinces, 53; South America, 3, and Spain, 1. The following are the ages of the people, in periods:

"Under five years of age, 416; between five and ten, 314; ten to fifteen, 296; fifteen and twenty, 509; twenty and thirty, 1028; thirty and forty, 537; forty and fifty, 271; fifty and sixty, 159; sixty and seventy, 81; seventy and eighty, 26; eighty and ninety, 6; ninety and one hundred, 1.

"The above population live in 489 houses, and constitute 619 families."

In connection with the above, as illustrating the connection between intelligent industry and the fine arts, notice the following, found in the village paper of Clinton:

"Music on the Common.—We are informed that arrangements have been made for music on the common every Thursday evening, by the Clinton Brass Band. Should Thursday evening prove stormy, they will play on Friday evening, and if both are unpleasant, it will be omitted for the week. The arrangement goes into effect next week."

GATHERING AND PRESERVATION OF FRUITS.

This is a subject respecting which we have much to learn in this country; and considering the vast amount of capital invested in fruit-culture, and the prospective importance of the business in a commercial point of view, it becomes worthy of serious and immediate attention. How many of those who are in the possession of orchards and fruit gardens know exactly when even to *gather* fruits in order to secure their greatest possible amount of excellence? May we not safely say that three-fourths of nearly all our summer fruits are consumed in an immature state? The keeping of fruits in winter, and the packing for distant markets, are questions that concern deeply the extensive orchardists of this country. We have translated from the *Revue Horticole* the following observations on this subject, by Prof. Dubreil, formerly of Rouen and now of Paris. They contain many valuable hints and suggestions worthy of attentive perusal.—*Horticulturist.*

"The preservation of fruits is a question intimately connected with the fruit-garden. This should furnish during the entire year the same quantity of the best possible fruits. In order to do this, it is true we must plant an equal number of varieties ripening their fruits during each month of the year. But this will be insufficient unless we adopt a mode of preservation which will retard the ripening of fruit to mid-winter, spring, or even the following summer. The fruit-garden cannot give the results expected from it, if we are deprived of its products, from February to June, when the earliest fruits begin to ripen. This question, then, has a certain importance, not only for those who gather and consume the fruit, but for those who deal in fruits and who, without proper modes of keeping, are exposed to great losses. As the mode of gathering has a certain influence on the preservation of fruit, we will first treat of that operation.

I. ON GATHERING.

"1st. Degree of Maturity.—Fruits should be gathered when they present a sufficient degree of maturity; and in this respect the different species of fruits require different treatment.

"*All the Stone Fruits*, the cherries excepted, should be taken from the tree three or four days before their absolute maturity.

"*The Kernal Fruits of Summer and Autumn* are gathered eight to twelve days before maturity.

"These fruits possess, then, the necessary elements to accomplish their maturition, which is nothing more than a chemical reäction independent in some measure of vital action. In thus separating them from the tree they are deprived of the sap from the roots, they elaborate more completely that which is contained in their tissue, the sugary principle is then less affected by water, and a higher flavor is therefore acquired. The time suitable for gathering is when the side next the sun commences to change from green to yellow.

"*The Cherries, Gooseberries and Raspberries* are only gathered after their perfect maturity; but they should not be allowed to pass this moment, as they immediately lose some of their qualities.

"*The Kernal Fruits which ripen only in Winter*, are gathered when they have accomplished their full development, and before vegetation has com-

pletely ceased—that is to say, from the end of September to the end of October, according to the variety, the earliness of the season, and climate. Experience has demonstrated that fruits left on the trees after their growth do not keep so well; they lose their sugar and perfume, because at this time the temperature is ordinarily too low for the new fluids which arrive in their tissue to be sufficiently elaborated. If, on the contrary, this epoch is anticipated, the fruits wither and do not attain maturity. It is equally necessary to gather the fruits from the same tree at different times—first, those placed on the lower parts of the tree; then, eight or ten days after those on the upper part, of which the growth is prolonged by the influence of the sap, which remains longer in this part of the tree. For the same reason the fruits of standard trees in the open ground are gathered later than those of espalier, and those of aged or languishing trees before those of young and vigorous ones. The precise moment for the gathering of each fruit is indicated by the facility with which it is detached from the tree when slightly lifted upwards.

"Various instruments under the name of 'Fruit Gatherers' have been invented to detach the fruits at the tops of the trees without the aid of ladders; but their employment is too slow, and the fruits are more or less bruised, and do not keep. When the fruits are gathered, they are deposited in a basket similar to that used by the cultivators of Montreuil, (fig. 1.) It is about two feet long, eighteen inches wide, and a foot deep, with a carpet on the bottom. The fruits are laid in one by one, and only in three rows or tiers; when too many are laid on the top of each other, the bottom ones are bruised. Each tier is separated by a quantity of leaves. If they are peaches, each one is enveloped in a leaf of the vine. The basket, being sufficiently full, is carried on the head into a spacious and airy place, where the fruits are deposited on leaves or dry moss; the table of the fruit-room can serve this purpose. There the summer and autumn fruits achieve their maturity, and are taken thence to be consumed. The peaches should be cleaned of the down which covers them, and which is disagreeable to the mouth.

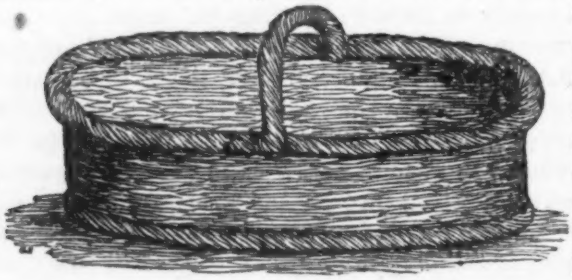


FIG. 1.

"*Grapes*, for immediate consumption or to be preserved fresh, are gathered only at perfect maturity; the longer they are left on the vine, the more sugary principle will be developed. Grapes from contre-espaliers are to be preferred for keeping to those from espaliers, as experience has demonstrated to the cultivators of Thomery that they keep better.

"*The Dry Fruits*, such as filberts, chestnuts, etc., are gathered at the moment when they detach themselves from the trees.

"In gathering fruits, a dry time and a cloudless sky should be chosen; and the middle of the day, from noon to four o'clock, is the best time to operate, as the fruits are charged with less humidity, the flavor is more concentrated, and those destined to be preserved keep better. This rule applies to all fruits.

"2d. Mode of Gathering.—The best method of gathering fruits consists in detaching them one by one with the hand. All pressure should be avoided as far as possible, as every bruise is followed by a brown spot, which gives place to and brings on the rapid decay of the entire fruit.

II. PRESEVATION.

"The preservation of fruits can only be applied to those which ripen during the winter, and which, detached from the tree before the first frosts, are placed under shelter from the cold to complete their maturity. The grape only is an exception to this. Summer and autumn fruits are also preserved, but only by the aid of certain proceedings, such as *drying*, and cooking more or less perfect, added to the exclusion of air or the addition of sugar, proceedings which result in discoloring the fruit and altering their flavor more or less sensibly. We cannot here describe the different methods.

"To preserve the fruits of winter, it is necessary, first, to prevent the action of frost, which disorganizes them completely; second, to retard the progress of their maturity in such a manner that a certain number of them will not ripen till toward the month of May in the following year. Experience has demonstrated that decomposition succeeds quite rapidly to complete maturity, and that it is impossible to prolong their preservation beyond this point.

"To obtain more or less perfectly the two-fold condition which we come to describe, depends upon the construction of the place in which the fruits are deposited, the fruit-room, and to the care which they receive.

"1st. OF THE FRUIT-ROOM.—The fruit-room will give the more satisfactory results in proportion as it fills the six following conditions:

"1. *That its temperature be uniformly equal.* It is by changes of temperature, which expand or rarify the liquids contained in the fruits, that fermentation is excited and the interior organization destroyed—phenomena from which result maturity or ripeness.

"2. *That this temperature should be eight or ten degrees above freezing.* A higher temperature favors fermentation too much. If, on the contrary, it is lowered two or three degrees, this fermentation ceases, and maturation becomes stationary. Thus we see fruits preserved five or six months in an ice-house. In this case the end aimed at has been exceeded; for we are obliged, in taking them from the ice-house, to expose the fruits for a certain length of time to a higher temperature, in order to ripen them. The fruits thus preserved ripen afterwards with difficulty, and their quality is often found altered.

"3. *That the fruit-room be deprived of the action of the light.* This agent also accelerates maturation in facilitating the chemical reäctions which produce this phenomena.

"4. *That all the carbonic acid discharged from the fruits be retained in the atmosphere.* This gas, it appears from experiments of Couverchel, contributes powerfully to the preservation of fruits.

"5. *That the atmosphere be more dry than humid.* Humidity is also a condition necessary to fermentation; it diminishes the resistance of tissue in the fruits, and favors the effusion of its juices. It is, then, proper to avoid its accumulation in the fruit-room; but it must never be completely dry, for the fruits losing then, by evaporation, a considerable quantity of the aqueous fluids wither, dry up, and do not ripen.

"6. *That the fruits are so placed as to diminish as far as possible the pressure which they exercise upon each other.* This continued pressure determines the rupture of the vessels and cells toward the point of pressure, the different fluids are mingled, and this mixture promotes the chemical combinations which result in maturity.

"We propose to construct a fruit-room to fulfil these conditions, in the following manner:

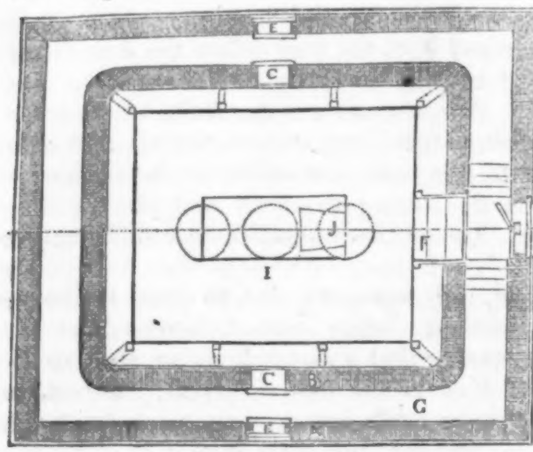


FIG. 2.

"We would choose a very dry soil, somewhat elevated, facing the north, and completely shaded from the sun by high plantations of evergreen trees. The dimensions are to be determined by the quantity of fruit to be preserved. That of which we give the plan (fig. 2) is 15 feet long in the inside, 12 feet wide, and 9 feet high. This will give place to 8,000 fruits, allowing each one to occupy 4 inches square. It is sunk $2\frac{1}{2}$ feet in the ground; and if the soil is very dry, it may be 3 feet. This enables us the more easily to guard the atmosphere against the external temperature. To prevent surface water from accumulating in the surrounding soil and filtering into the fruit-room, the surface of the ground should descend from the walls, and these should be constructed of cement a foot above the soil.

"This fruit-room is enclosed by two walls, (A and B,) leaving between them an open space (G) about 10 inches wide. This stratum of air interposed between the two walls is the surest means of protecting the interior from the exterior temperature. The two walls are each 12 inches thick, constructed with a sort of mortar, or mud, made of clay and straw. This material is cheap, and on the whole a bad conductor of heat, and on this account preferable to common masonary. The walls are pierced with six openings—three in the inside and three on the outside walls—the first similar and exactly opposite to the last. The openings for the outside wall are—

"1. The double door (D); the outside door opens out; that of the interior inward, and it opens in two parts, like a shutter. When the frosts are severe, the space between the two doors should be filled with straw.

"2. Two windows, (E,) about 20 inches square, placed on each side, and opening at 18 inches from the soil, and closed by a double sash, of which the one closes out and the other in. The space between the two sashes should also be carefully filled with straw at the commencement of winter.

"The inside wall has a door (F) and two windows (C); but here the door is simple; the windows are also closed with two sashes, the outside one sliding in a groove, and the other opening out.

"As soon as the fruits are collected in the fruit-room, the joints and openings around the windows should be filled with paper, to prevent the air from the space between the walls entering the fruit-room. The four windows are only intended to admit air and light necessary to dry and ventilate the fruit-room before gathering in the fruit. We shall presently see that it is easy to get rid of the interior humidity produced by the presence of fruits, without employing currents of air.

"The ceiling, sustained by beams, is composed of a layer of moss, sustained by laths, and covered above and below with a layer of plaster; the whole

being one foot thick. This mode of construction is necessary to exclude the influence of the exterior temperature.

"The roof is thatched a foot thick with straw, and the dormer may be used for storing fodder in; but the points of union between the dormer and the outer wall must be perfectly close.

"The floor is of oak. The walls, and even the ceiling, should have a covering of boards. These precautions serve to maintain an equal temperature, to exclude exterior moisture, and to completely separate the atmosphere of the fruit-room from that without.

"All the interior walls, from 18 inches of the floor to the ceiling, are furnished with board shelves, 2 feet wide, placed 10 inches apart. To facilitate the arrangement of the fruit, the upper shelves (A, fig. 3) are made to slope downward in front, at an angle of 45 degrees; and this decreases as they come down, until the lower ones within four or five feet of of the floor are horizontal.

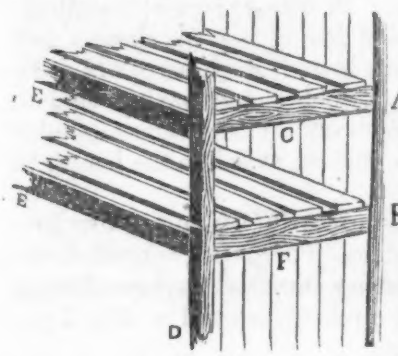


FIG. 3.

"The tables or shelves are all made of narrow strips about 4 inches wide; and to facilitate the circulation of air, about an inch of space is left between each strip. The shelves are fixed to the wall by brackets, sustained in front by upright posts (D) placed 4½ feet form each other. The cross-pieces (E) attached to the uprights, support horizontal laths (F), or oblique ones (G.)

"In the center of the fruit-room we reserve a table (I, fig. 2,) 5 feet long and 2½ feet wide, separated from the shelves by a space of 3 feet. This table serves to receive the fruit temporarily, and has a narrow molding round the edge to keep it from falling off. All the shelves have similar borders.

"Such is the mode of construction we propose for a fruit-room, by the aid of which we can easily obtain many of the results which we have indicated as necessary—that is to say, it will enable us to maintain an equal temperature of 45 to 50 deg. Fahrenheit above zero, and that the action of the light is prevented. As for the other necessary conditions, we shall presently point out the means to secure them. In certain circumstances, much of the expense of a construction like the above might be avoided. If, for example, there was a subterranean cave or a grotto in a rock, a fruit-room might be established in either place, provided they be very dry. The interior fitting up would be the same.

"As the fruits are brought into the fruit-room, they are deposited on the table, which is covered with a thin layer of dry moss. There they are assorted; each variety is placed separate, and all unsound or bruised specimens are taken out. The sound fruits are left on the table two or three days, in order that they may part with some of their moisture. The shelves are then covered with a thin layer of dry moss or cotton, to prevent the fruits from being bruised by their own weight. We then proceed to wipe the fruits slightly with a piece of soft flannel, and arrange them in rows on the shelves leaving a space of a fourth of an inch between each, and keeping each variety separate, and placing similar varieties next each other.

"The fruit-room may not only serve for the preservation of kernal fruits,

but for *grapes.* The Chasselas varieties in particular keep well in this way. We proceed with them as follows; Each bunch is cleared of all decaying or unsound berries, and fixed by the *point* on a small wire hook formed like an S (fig. 4). Thus attached it is less liable to decay, as the berries have a tendency to separate from each other. The bunches are then hung by the other end of the S hook around one or two hoops (fig. 5) placed one above the other, and suspended from the ceiling of the room, and rendered moveable by two small pullies.

FIG. 4.

"If it be desired to keep in this way a large quantity of grapes, space may be economized by substituting for the hoops wooden frames (fig. 6), about 4 feet square. These frames are furnished with strips of rods, separated from each other by a space of 3 or 4 inches, and having on one side small pins to suspend the crotchets of grapes on. These frames are also fixed to the ceiling so as to occupy all the surface, and, like the hoops, to move up and down as may be necessary.

"The grape-growers of Thomery, who preserve a large quantity of grapes, content themselves with placing bunches on wire frames, on which they probably spread a thin layer of very dry fern.

"When all the fruits are thus arranged in the fruit-room, the doors and windows are left open during the day, unless in wet weather.

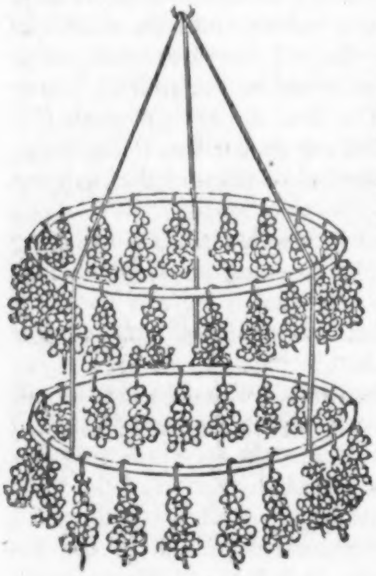


FIG. 5.

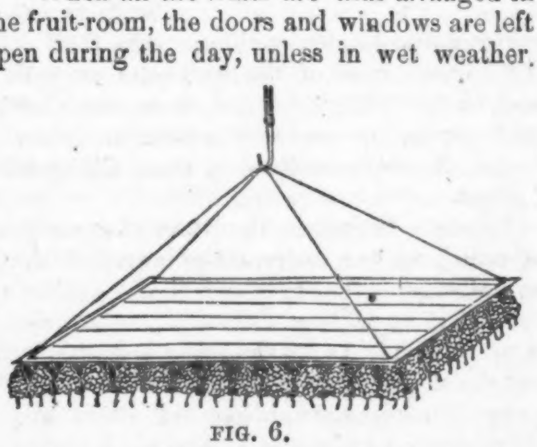


FIG. 6.

Eight days' exposure to the air in this way will be necessary to deprive the fruits of their surplus moisture. After that, a dry and cold time is chosen to close hermetically all the openings. The doors must be opened no more, except when necessary to enter.

"Until the present time we have employed no other means to remove moisture from the fruit-room but by creating currents of air more or less intense. This mode is attended with serious inconveniences for the preservation of fruit. In the first place, it produces an equilibrium of temperature between the atmosphere of the fruit-room and the exterior, and this change is very injurious to the fruits. In the second place, a glare of light is instantly admitted to the fruits, and this is no less injurious than the change of temperature. In fine, this vicious method should not be practiced unless the exterior temperature is not below the freezing point, and the weather is dry. In the winter, however, the weather is generally the reverse of this, and the fruits have to be abandoned to a destructive moisture.

"To escape this difficulty, we advise the use of *chloride of calcium.* This has the property of absorbing so great a quantity of moisture (about double its own weight) that it becomes liquified after being exposed for a certain time to a moist atmosphere. Fresh lime has the same property of absorbing moisture; but at the same time it absorbs the carbonic acid set free by the fruits, and it is important to save this gas, as it aids materially in preserving them.

"To employ *chloride of calcium*, a sort of wooden box should be constructed (A, fig. 7), lined with lead (F), about 18 inches wide and 4 inches deep. It is raised about 18 inches from the floor, on a small table (B) having one of its sides (C) about 1½ inches lower than the other. At the middle of the lowest side of the box a small mouth is fixed for the liquified chloride to run over into a stone jar (E) placed below it. The chloride is spread in the box in small porous particles, very dry, and about 3 inches thick; and if the quantity employed be entirely liquified before the fruit is consumed, a fresh supply may be added. About fifty pounds applied at three times is sufficient for a fruit-room such as is described above. The liquid which results from this operations should be carefully saved in the jar, and be kept covered until the following season. When the fruit-room is filled anew, the liquid may be put in a brass kettle and placed over the fire, where it will soon evaporate to perfect dryness, and may be employed again in the same manner as before.

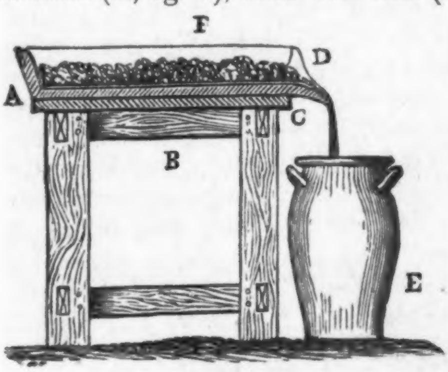


FIG. 7.

"Such are the cases necessary to fill the conditions we have indicated for the preservation of fruits. The fruit-room should be visited at least once in eight days, to remove the fruits which begin to decay, set apart those which are ripe, remove the decaying berries from the grapes, and renew the chloride of calcium."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

FOREST TREES OF NICHOLS, TIOGA CO., N. Y., AND THEIR USE.

No. 1. *Ulmus Americana*—American Elm, White Elm. A large tree growing only in the vicinity of streams, and seldom found on hills, and from 60 to 90 feet in height, and 2 to over 3 feet in diameter, when old. The body uneven, frequently flat on two sides, while others are found with ridges projecting out on one side and a groove on the other; and frequently three or four such grooves and ridges. Bark on large trees deeply grooved and rough, of light gray color. Full of branches, that are often from 40 to 50 feet in length, with a regular taper from end to end. One tree near by me, with branches extending 35 or 40 feet in every direction, being the widest spreading tree that I have ever seen, with limbs bending over in a graceful manner on all sides. Frequently the body is covered with short, slim branches from

the ground to the main branches, giving the tree at a distance an appearance of being covered with a green running vine; young sprouts frequently covered with pubescent leaves, smooth above, pubescent on the end or side, from 2 to 5 inches in length, and 2½ in breadth, with short stems, and from fifteen to 19 ribs on a side and doubly serrated, a notch being at every rib with a small one upon the large, frequently one side of the leaves longer than the other. Flowers appear before the leaves, and this year on the 24th of April, in great numbers, giving the tree a beautiful yellowish-green color in perfect clusters. Fruit, or seeds, about ⅝ of an inch in length an d½ breadth, that is, the husk that contains the seed; edges of the husk covered on all sides with a fringe about one-sixteenth of an inch in length, and being of an oval shape, when ripe they are carried away by the wind. The seeds are about the length of a flax-seed and a third wider; seeds about all ripe, and are dropped by the first of June. I have two large spreading elms near the edge of my corn-field that have produced thousands of seeds, that have vegetated over a large part of the field. The first time hoeing the corn did not destroy them all, and on the 30th day of June they were two inches in length, and the largest had four leaves. This elm is useful in preserving the banks of streams; the larger roots are frequently 70 or 80 feet in length. It makes good firewood, being as good as hickory. It is more full of alkali than almost any other wood, as the soap-makers can well testify.

No. 2. *Ulmus Fulva*—Slippery Elm, Red Elm. The Slippery Elm is getting quite scarce in this vicinity, and is found only on the lowest land. This tree here is found from forty to fifty feet in height, and from 12 to 15 inches in diameter; the common observer would not distinguish it from the other species of elm. Perhaps the leaves are a trifle larger, and the young sprouts more pubescent. The inside bark contains valuable medical qualities, being mild mucilage, which is used for dysentery, coughs, colds, and externally as a poultice. Flowers in April. Fruit in May.

3. *Ulmus Racemosa.*—White Elm. With this elm I am not much acquainted, but like the other species, it grows on low land near streams, and often attains a large size. One tree in this vicinity I should judge to be 100 feet in height and two feet in diameter, and 70 feet without a branch. I think this species does not branch as much as the two preceding, or so low down. I have noticed a number near Rosebank, Canada West, that were over 100 feet high and 3 feet in diameter, and between 70 and 80 feet without a branch. The bark of this species is more deeply furrowed than the preceding. Flowers in April, and fruit in June. The wood is very tough, and is used here for making axe-handles and whip-stocks. R. Howell.

Nichols, July 3, 1855.

Black Knots in Plum Trees.—The following process has proved a cure for this troublesome disease in several experiments, and we commend it to our readers for a careful trial:

"Cut out the diseased wood as thoroughly as possible, and then apply spirits of turpentine. Cover the wound immediately after the application of the turpentine with grafting-wax."

THE GRITTINESS OF PEARS.

Some of the very finest of our fruits are occasionally injured very materially by a hard gritty texture, either extending entirely or partially through its substance. We have known for some years that this could be to some extent controlled by a judicious process of ripening. A friend of ours at the Horticultural Rooms in Boston, of whose method of preserving fruits we have before alluded, is also successful in the prevention of the evil here described. But his efforts are directed to the specimens after they are plucked from the tree. In the last number of the *Florist* we find a process described which is well worthy of consideration. If it is as successful as is claimed for it, it will well pay the labor it requires. The article referred to is as follows:

The grittiness of pears is the chief circumstance which diminishes their value at the dessert. Some are more subject to the affection than others; but all are occasionally deteriorated by it. The proximate cause is known to consist in the deposit of hard matter in certain cells of the flesh, analogous in all respects to that which gives its bony texture to the stone of plums, cherries, etc. In all these cases, the tissue is originally soft and pulpy, and if it were to remain so, the whole of a plum would be as perfectly eatable a s aberry of the grape. But in stone fruits gritty matter is gradually deposited within the pulpy cells of the lining of the flesh, as constantly and naturally, as phosphate of lime in the gelatinous tissue of the bones of animals. In the pear, on the contrary, there is no special part set aside for the reception of the grit, which manifests itself accidentally here and there among the soft flesh, sometimes in large and sometimes in small quantities. In fact, in the pear, the grittiness may be regarded as an unnatural secretion, induced by unknown causes, while in stone fruits it is part and parcel of their nature.

We say induced by unknown causes, for we are not aware that any attempt has been made to show out of what circumstances the grittiness arises, or by what it is diminished or prevented. We are now, however, assured that it is entirely owing to the exposure of the pear fruit to too much cold. It appears that on the 16th of last November, Mr. A. Delaville, gardener at the Chateau de Fitz James, near Clermont, (Oise,) exhibited before the Imperial Horticultural Society of Paris, some St. Germain pears, a part of which were covered with spots and full of grittiness, while the others were remarkable for their beauty, and wholly exempt from grittiness. We are assured that both samples came from the same tree, and that the only difference consisted in the fine ones having been protected, while the others had been exposed to the weather without any shelter. In fact, M. Delaville is of opinion that the external spots and the internal grittiness were wholly caused by the cold rain which had fallen on the fruit during its growth, and had arrested the free circulation of sap.

With reference to this hypothesis, he remarks that the sorts which are most subject to spotting (*tavelage*) and grittiness, are those which have the finest skin, such as the St. Germain, Crasanne, Brown Beurre, and Winter Bonchretien. The effect of aspect also supports this view, it being notorious that the affections in question are most common with pears on open standards, or exposed to the east and south, the quarters whence (at Clermont) the coldest rains always come.

The manner in which M. Delaville protects his pears is thus described:—

As soon as the fruit is completely set, he encloses every cluster in a cornet of paper, fixed to the top of the stock by a piece of rush (bast.) This cornet must be large enough to cover all the upper part, so as to guard the fruit perfectly from the direct action of exterior agencies. If a tree is trained to a wall the same degree of protection is not necessary, because the wall affords a natural shelter on one side, but where pyramid or other openly-trained trees have to be dealt with, the cornet must be very wide, and the small end placed upwards, so as to leave nothing uncovered except the bottom of the fruit stalk.

These cornets remain in their places during the whole season, and are not disturbed till about a fortnight before gathering, at which time they are removed, in order to give the fruit color and to complete the ripening, "just as peaches and grapes are unleafed a short time before gathering them." M. Delaville concludes by assuring the public that by this simple method his whole crop of pears is very fine, instead of a third or more being unmarketable as is often the case.

The effect of these precautions should certainly be tried here, now that pears are getting into the condition when paper cornets are first applied.—*Gard. Chron.*

POOR FARMING EXPENSIVE.

THE truth is, poor farming is an expensive business. The cost exceeds the income. If from a very low grade of farming, which must of course be unprofitable, we ascend to a better condition of the art, we shall come to a point where there is neither loss nor gain; the income equals the outgoes; the ends meet, as they say. And this, if we understand these matters, is the very condition in which nine-tenths of our farming now is.

The farmer of a hundred acres puts on his farm in his own labor, in the labor of his wife and his children, in taxes, insurance, etc., $500. And he takes off in some marketable produce or for home consumption, $500. "The ends meet;" and if there were no better way he need not complain; for he is working his way through the world as quietly and as easily as most men; for the development of high moral qualities he has the advantage of most others; and what is more, he has the best possible means of training his children to those habits of industry and frugality which more than conspire to make them good men and women and worthy citizens. Let him not, therefore, complain. But if there is a better way, let him fall into it. We do not believe that farming is necessarily limited to the operation of putting on $500 and taking off $500, and living by the operation, only because what is put on is mostly in the form of labor done by the family. If a farm will give $500, with the labor of one man, it will give a great deal more with the labor of two men; and the excess will more than balance the wages and board of the second. Instead of putting on $500 and taking off $500, the better way is to put on $700 and take off $900; and then to put on $900 and take off $1200. There is doubtless a limit beyond which the income could not be made to increase above the expenditures; but very few of us are in danger of going beyond the limit. There is much more danger of falling short of it. Our standard is too low. Men are afraid to trust their land, lest it should not pay them. It is the best paymaster in the world.—*The Farmer, by* J. A. NASH.

THE PROFIT OF FATTENING SWINE.

In the *Monthly Farmer* for April, 1854, there are statements over my signature relative to the profit of fattening swine in New-England, together with hints as to the proper mode of conducting the business; and in the following number for May, there is a shorter article, confirming the statements previously made. Since writing those articles, I have further investigated the subject, in order to prove the soundness or otherwise of the views then presented.

On the 21st of December, 1854, I bought four very lean shoats, weighing respectively, 63, 61, 60 and 58 lbs., or in all, 242 lbs., gross live weight. They were placed in warm apartments, consisting of a pen for making compost, and an eating-room. The litter made by two horses was daily thrown into the compost pen; also, about every third week, a cord, or two loads of either muck or forest-mould was put into the pen; and clean straw was added, at suitable times, for bedding. The pigs were fed on meal made by grinding ears of corn, or on what is called corn and cob meal, and they were supplied with all the meal they would eat with a good appetite. Immediately after feeding them at a given time, the meal for the next feeding was placed in the bucket, and boiling water was added, and also after awhile the wash of the kitchen, the whole standing in a warm place till the time for feeding, and the meal becoming thoroughly soaked and very much swollen. Whenever a grist of ears of corn was to be carried to mill to be ground for the pigs, the same was accurately measured up in a basket, well known to hold the right quantity of ears, when even full, to make a bushel of shelled corn; and the pigs were charged with each grist at the time it was measured. Entire accuracy was aimed at in keeping the account with the pigs, and I know of no chance for a slip in the accounting.

The business was thus conducted till the 14th of the present month, when the pigs were sold to the butcher for eight cents per pound, dressed—he charging three dollars for slaughtering the four. Between the dates above named, the pigs consumed seventy-six bushels of corn on the ear, equal to thirty-eight bushels of shelled corn. During this time they manufactured eight cords, or sixteen loads of muck and mould into the first quality of compost, mingling the raw materials well with the horse manure and straw for bedding. They may be accounted with as follows:

825 lbs. of dressed pork, at 8 c. per lb.		$66 00
Deduct 76 bu. ears of corn, or 38 bu. corn consumed, at an average price of $1 25 per bu.	$47.50	
Deduct paid for slaughtering	3.00	
Deduct paid for pigs at outset, $3 00	12.00	62.50
Balance over market price of the corn		3.50
Add 8 cords or 16 loads of raw material manufactured into compost, worth a bu. of corn, or $1.25 per load	20.00	
From which, if you please, deduct the cost of supplying the material, say 50c. per load, which is rather high	8.00	12.00
Profit on four pigs, over and above market value of corn consumed		$15.00

With regard to the price at which the corn is charged to the pigs, I have to say that in January the thirty-eight bushels could have been bought for a dollar per bushel; and at less than a dollar and a quarter as late as March, though now corn is worth more than the price charged the pigs.

It will be found on calculation that these pigs gained some over fifteen pounds of net pork to each bushel of corn consumed; which argues pretty well for the mode of feeding, and for the business of converting corn into pork and compost.

Another year's practice and observation has not disclosed any thing material for me to deduct from the view formerly advanced as to the policy and profit of fattening swine. I still entertain entire confidence in the desireableness of the business, when conducted with system and propriety. Indeed, I have never seen the year in farming when I was not well paid for fattening pigs of a good breed, fairly reckoning their services as manufacturers of fertility for the land. In my judgment, it is sounder practice for the farmer thus to add to his means for making crops and keeping his lands in good heart, than by buying the fashionable concentrated fertilizers of the day, which too often merely stimulate the present crop, and leave the land no better than they found it.

Notwithstanding the great prejudice existing with many persons against the grinding and feeding of the cob with the corn, it is sufficient for my purpose to know, as I do by repeated trials, that corn and cob meal, properly ground and cooked, will make from twelve to sixteen pounds of net pork for each bushel of corn consumed. F. Holbrook,

in New-England Farmer.

Brattleboro', May 22, 1855.

Baldwin Apple.—To Medford belongs the introduction of the celebrated "Baldwin Apple." The first tree producing this delicious fruit, grew on the side-hill, within two rods of the former Woburn line, and about ten rods east of the present road which leads from West Medford to the ancient boundary of Woburn. It was on the farm occupied by Mr. Thompson, forty or fifty rods south of what used to be called the "black horse tavern." At the request of Governor Brooks, the writer made a visit to that tree in 1813 and climbed it. It was very old and partly decayed, but bore fruit abundantly. Around its trunk the woodpeckers had drilled as many as five or six circles of holes, not larger than a pea; and, from this most visible peculiarity, the apples were called "Woodpecker Apples." By degrees their name was shortened to *Peckers;* and, during my youth, they were seldom called by any other name. How they came by their present appellative is this: Young Baldwin, of Woburn, afterwards a colonel, and father of Laomi, was an intimate friend of young Thompson (afterwards Count Rumford;) and, as lovers of science, they asked permission of Professor Winthrop to attend his course of lectures in natural philosophy, at Harvard College. Twice each week, these two thirsty and ambitious students walked from their homes in Woburn to bring back with them from Cambridge the teachings of the learned professor. One day, as they were passing by the "Woodpecker Tree," they stopped to contemplate the tempting red cheeks on those loaded boughs, and the result of such contemplation was the usual one—they took and tasted. Sudden and great surprise was the consequence. They instantly exclaimed to each other that it was the finest apple they ever tasted. Some years after this, Col. Baldwin took several scions to a public nursery, and from this cir-

cumstance they name the apple after him, which name it has since retained. In the gale of September, 1815, this parent tree fell; but very few parents have left behind so many flourishing and beloved children.—*History of Medford by Rev. Chas. Brooks.*

Farmers by Adoption.—We know a great many farmers in Grant county who acquired a training in other pursuits, yet succeed better than those who were raised on a farm. They soon acquire a mode of management that others do not attain in a life-time. We account for it in this way: they turn to farming because they have a love for it, and prosecute what they love best with most zeal; their superior business-tact acquired in other pursuits is applied to the farm with more advantage than to the business of their youth, and also with better profit. Another peculiarity about those who have but recently forsaken the business of their early training and went to the farm: they are all great readers of agricultural publications, they follow all new suggestions, forsaking the old, with as much pleasure as a dandy lays by his not quite thread-bare coat for a new one of the latest fashion, and in most cases with nine times the profit. Yes sir, the man who adopts farming at thirty, adopts also the farm book, the *Wisconsin Farmer*—and the *Herald*—*Grant County Herald.*

THE WHEAT CROP.

This crop is of very great value, second perhaps, in importance, only to that of corn and cotton. The origin of wheat is unknown. It was introduced into this country in its very infancy, and its cultivation has increased with the increase of the country, until the value of the annual growth is nearly or quite $100,000,000. Still, of late years the crop in New-England has materially diminished, and our journals have expended a vast amount of ink and paper, and our journalists of an *indefinite* amount of brains to explain this decrease. To us it seems a very simple affair. The climate, soil, etc., all the numerous circumstances and conditions which naturally affect this growth, resulting in a healthful or diseased condition of it, are such that it is not to be relied upon as a profitable crop. Hence it is not a favorite, but gives place to some of the numerous growths which are more desirable. Besides this, the land appropriated to this crop is not sufficiently cultivated. Though there are sections of the State of New-York where the crop succeeds very well, we are by no means sure that it would not be a gain in the end, if the culture of it through the State was entirely abandoned. That there are large sections in which such gains would result, we are very confident; and while vast regions of the west and north-west produce it so abundantly, we should not see cause for anxiety if the millions of bushels raised in the

Empire State should become thousands—hundreds. So, perhaps, in some other States. It has repeatedly been stated that there are large sections of country in which the crop does not pay its cost of production. Prof. Mapes, after a very careful examination of statistics, expressed such an opinion some years ago. In this we fully concur with him. So meagre is the crop in these sections, that through the whole extent of this country, the average crop has been estimated at scarcely more than ten or twelve bushels per acre; and this minimum is not a paying crop. But by the last census it appears that the entire crop was less than 100,500,000 bushels, while 11,000,000 of acres were devoted to its growth, and this gives us less than ten bushels per acre. How much reliance should be placed on these figures each one must judge for himself. It must be to some extent only the result of opinion rather than of accurate calculation. As to the produce per acre in several States, the census returns for 1850 contain the following:

Massachusetts grows 16 bushels; Florida, Pennsylvania, and Texas, 15 bushels; Iowa and Wisconsin, 14; Maryland and Vermont, 13; Indiana, New York, and Ohio, 12; Delaware, Illinois, Missouri, New-Hampshire, and New-Jersey, 11; Arkansas, Maine, and Michigan, 10; and all other States still less; Georgia yielding only five bushels per acre. Under the influence of these figures we are tempted to use even stronger language than we have used as to the cultivation of this crop. Good wheat land ought to produce from twenty-five to thirty-five bushels at least, and even then it would not pay as well as corn.

There are various kinds of wheat. Perhaps about a dozen varieties have each their own peculiar characteristics. Of these some are "spring wheat" and some "winter wheat," the latter being sown in the fall, and remaining in the ground through the winter. The spring wheat has a smaller grain, contains a greater proportion of gluten, and is of less value in the market. No two kinds, however, are equal in these respects. Some of our very abundant crops are peculiar; and yet their peculiarities are not understood. There is a vast difference between the Howard-st. flour and the Genesee flour. Let the house-wife accustomed to the latter only, make a batch of bread of the former, and it will be as tough as the strongest teeth would desire. The excessive amount of gluten requires more water and a thinner mass than some other varieties. But this only in passing. We shall recur to it again.

The following have been pronounced the best varieties of wheat by the highest authorities:

1. White Flint; 2. Improved White Flint; 3. White Provence; 4. Old Red Chaff; 5. Kentucky White Bearded; 6. Indiana Wheat; 7. Velvet Beard, or Crate Wheat; 8. Wheatland Red; 9. Golden Drop; 10. Mediterranean; 11 Blue Stem, etc. All these, and others that might be added, probably belong to one of four distinct and permanent species. Such, at least, is the opinion of Von Thaer, although he inadvertently, we suppose, calls them genera. The genus is Triticum, and the points of diversity noticed are the basis of *specific* distinction. Permanent diversities of the flower or blossom exclusively control the generic divisions of plants, while differences in leaf, stem, etc., etc., give rise to species.

Nor do the distinctions noted among the different kinds of wheat appear to be very satisfactory. If the winter wheat is sown in the spring these distinctions appear materially changed, as the plant in appearance approximates to the characteristics of spring wheat. *Possibly*, under a zealous perseverance, these experiments and these differences would entirely disappear. It is generally found that spring wheat will not endure through a winter. But

we are not satisfied that a gradual training to exposure to cold would not discover that this even was not a feature utterly beyond control.

The excellence of wheat may be summed up in the following particulars:

Straw, medium size, strong, not peculiarly liable to the attacks of insects, not sensitive to frost.

Heads long, well filled; *grains*, large, solid, white, and rapidly germinating. *Chaff* not easily separated from the grain.

Good wheat weighs sixty pounds to a bushel; sometimes as high as sixty-six.

Of the varieties we have named, the first and third are remarkable for the weight of straw; the second for large berry; the first, third, seventh, and tenth are less liable to disease, or the attacks of insects; first, third, and seventh bear the frost well. Perhaps the first may be remarked as the most productive.

The constituents of wheat are as follows:

Starch, sugar, or gum,	50.60	per cent.
Gluten or albumen,	16.18	"
Water,	10.18	"
Woody fiber,	22.26	"
Various salts,	2.04	"

Small grains grown in hot and dry air, are generally more nutritious than the larger grown in moist soil.

The proportion of gluten, as already suggested, varies very materially in different kinds of wheat. The greater the amount of gluten, the more water it absorbes, and the heavier is the loaf from the same weight of flour. Among the analogies illustrating this point we find the following:

With two pounds of flour and the same amount of yeast, in each experiment, that from northern flour (Cincinnati) weighed three pounds, the Alabama (southern) weighed three and a half pounds. But these proportions are controlled by circumstances.

Different kinds of manure change to a large extent the condition of these elements. Take for instance the elements of gluten and starch. An experiment used by Hermbstadt, with equal weights of different manures, resulted as follows:

	Gluten.	Starch.
Unmanured,	9.2	66.6
Vegetable manure,	9.6	65.9
Cow dung,	12.	62.3
Pigeon dung,	12.2	63.2
Horse dung,	13.7	61.6
Human urine,	35.1	39.9
Goat's dung,	32.9	42.4
Sheep's dung,	32.9	42.8
Night soil,	33.9	41.4
Ox blood,	34.2	41.3

It will be perceived that as the gluten increases the starch decreases. As to the point which element is the more desirable, our answer is this: For persons with stomachs like that of an ostrich, a large amount of gluten answers a very good purpose. For persons of limited digestive power it is fatal. For dishonest bakers who would make the loaf heavy with the least cost, encourage the increase of gluten. On the other hand, starch, farina, arrow-root, and all substances of that class, are universally wholesome food, and of easy digestion. Bread abounding in gluten, should be eaten before it

becomes dry; while that rich in starch remains moist and paletable for several days.

It is very fashionable now-a-days to study the use of soda and all alkalies in the place of yeast. We do not comprehend this. Just *look* into a dish of yeast and estimate its excellence as a diet. An excess of alkali is injurious. So is an excess of water as a counter-agent to an excess of acid, which is very common; soda is highly useful. We know of no good obtained from yeast, except that it makes the bread light, and this is accomplished as well by soda. But "there is no accounting for tastes;" and prejudices on this subject are quite as unmanageable and as ridiculous as exhibitions of "taste" are in other relations.

Wheat should be sown at a depth of one or two inches. M. Moreau planted thirteen beds, with 150 grains each, at various depths, and gives the following as the result:

Depth.	Came up.	No. of heads.	No. of grains.
7	5	53	682
6¼	14	140	2520
5¾	20	174	3818
4½	40	400	8000
4¼	73	700	16,500
3¾	93	992	18,534
2¾	123	1417	35,434
2⅓	130	1560	34,349
2	140	1596	36,480
1¾	142	1660	35,826
1	137	1561	35,072
½	64	529	10,587
On surface,	20	107	1600

Wheat of the preceding year is preferable for sowing. The success of this crop is very dependent upon the quality of the seed. Defective seed cannot produce a flourishing crop, but during its growth will ever be subject to all manner of diseases. This is also a very hungry crop. It impoverishes the soil more than almost any other. Or we might, perhaps, better avoid such phrases, though quite common, and say that it requires a liberal allowance of those elements of which most of our soils are eminently deficient. Where such deficiencies exist the growth must be very imperfect. Hence it should be sown either on the most fertile soils, or where for previous crops of a different nature, it has been liberally enriched with the phosphates or fertilizers producing soluble phosphates. Free acids are destructive to this crop. A large proportion of clay, that is, clayey soils, are suited for it, rather than sandy or silicious soils, though a free supply of lime, marl, ashes, etc., may secure on the latter a tolerable growth. All these, except the lightest silicious, should be thoroughly ploughed, the clods carefully broken, and the entire mass mellowed.

It may be sown in drills or broad-cast, at the rate of one and a half to two bushels per acre. Even more than this is often used.

Wheat straw is more nutritive as food than that of other grains, but is not more desirable for other purposes. The diseases and the insects to which this crop is particularly exposed will be considered in other papers, as well as the best preventives and remedies.

NORTHERN SUBSTITUTE FOR SUGAR-CANE.

We learn from a writer in the *Journal of Commerce*, that one of our missionaries in South Africa has sent here a few seeds of a plant which is pronounced a substitute for the sugar-cane in the manufacture of sugar, and which will grow well in our climate. The plant is called Imfe, by the Kaffres, but is known by many specific names. It resembles broom-corn, when growing. The natives of Natal cultivate it after the same manner as Indian corn, and it matures in three to four and a half months. It yields a larger quantity of sugar, say from 50 to 75 per cent. from the same bulk, but not of so good quality. It grows on either high or low land, and the abundant seed it produces serves well as feed for horses. A patent for the manufacture of sugar from this growth has recently been obtained in England.

DRAINING HEAVY SOILS.

Mr. Editor:—Much is said of late on the practicability of thorough drainage of soils before cultivation can be successfully carried out on the Farm. Many "teachers" claim that all soils capable of cultivation must be thoroughly drained previous to their becoming fit for good and profitable cultivation. They say in substance, that thorough draining moistens dry soils in dry weather as much as it relieves them of excess of water in wet weather. A doctrine to us about as reasonable as the (stove theory) namely, if one stove in use through the winter will save half of the farmer's wood over the old fire-place, then two stoves set at work ought to save it all. But first what is the object of draining soils? Why, it is of course to relieve them of an excess of moisture or water supposed to be in the soil. But then if there be no excess of moisture in the soil, should the soil be drained by "pipe-tile" in order to moisten these soils in dry weather by the use of air introduced into the soil according to the theory of these "teachers?" We say, no. If a "pipe-tile" is laid down in an ordinary soil, to carry off an excess of moisture supposed to be in the soil, will not this "tile" serve to collect what moisture there is in the soil in a dry time and "conduct" it off? Now instead of this plan, suppose you plow and sub-soil your lands to a reasonable depth, you then open the sub-soil so as to relieve the soil of surface water by heavy rains, also in dry weather moisture is drawn up from the lower sub-soil and retained near the surface with the air to circulate, and demands no "pipe-tile" to conduct off this moisture, but it is retained in the soil. Now we claim that this is all the "draining" that a majority of these "heavy soils" as they are called, need; namely, deep plowing and an occasional sub-soiling. But again, there is another class of heavy soils which want through drainage before they can be cultivated with the best success. On many such soils, in course of the season, the surface will be apparently dry, but a few inches below, stagnant water will be found resting on the sub-soil. Such soils should be thoroughly drained by "pipe or stone," to relieve the soil of

an excess of water. On most soils of this character the grasses on the surface will indicate the excess of wet by coarse and rush grasses, heavy ferns, and in some cases alders. Many of these soils are situated on high rolling lands, as it is a law of most of the water-courses that they come out near the surface on high lands, while low valleys and table-lands will be comparatively dry. Low swales, bog and swamp lands are another class of wet lands. These are mostly low lands laying at the foot of high lands and mountains. The draining of such lands and of swamps will depend on the situation of the land and the character and depth of the soil to be drained. There are in many sections of country nearly whole farms that would pay well for draining, we are well satisfied, but comparing such lands on farms to the whole amount of tillable land in a town or country, and the ratio of lands that repuire "drainage" would be very small. To find out how wet a soil must be in order to require draining, we think (Mr. Johnson of Geneva, N.Y.,) who has had much experience in draining, has given a good rule. It is in substance thus, dig pits or holes at several points in the fields where there is an appearance of water in the soil, at such depth as would be necessary to drain. If water gathers in these holes and stands for several days, it is a sure sign that there is an excess of water in the soil, which should be removed by drainage. We have occupied a hundred acres or so of tillable land, on which there was not an acre or half an acre that wanted any "draining" whatever. "Scientific teachers" declare to the contrary, notwithstanding. What our soil wanted was deep plowing. with an occasional sub-soiling, and this too at a much more thorough rate than we gave it, taking one season with another. But this doctrine that all tillable soils need draining by "tile" before good cultivation can take place, we consider to be as great a piece of "Empiricism" as was ever palmed off by any set of teachers on the agricultural public. Just look at the extra expense farmers must be subject too, if they follow these "teachers," rules of laying down "pipe-tile" to drain dry up-lands which they no more need than they do to have the "Gospel" explained to them. But then these "teachers" say that tile-drains moisten dry land as much in a drought as they dry it when wet. Very well. But few of the most of farmers can afford to lay down "pipe" to moisten their lands in a drought. After this plan, then, go ahead. They may get as much celebrity for "pipe laying" as certain politicians in New-York city once did. We prefer to adopt the more rational, and we think, economical plan, of plowing and sub-soiling in order to moisten land in a drought, and also to relieve it of surface-water in a wet time. Yours, etc., L. Dwands.

Derby, Ct., June, 1855.

CHEAT IN FERTILIZERS.

We have often advocated the importance of a sworn inspector of all guanos or other artificial fertilizers, and every month but adds to our conviction of the necessity of such a preservative against fraud.

One of our most able exchanges, the *Country Gentleman*, has recently charged a fraud of this kind upon our learned neighbor of the *Working Farmer*. We cannot believe so able and practised a teacher in this department should have descended to this depth of crime. We would rather hope and

believe that our Albany friend is misinformed. At any rate the learned Professor should at once firmly and explicitly deny the statement, or great injury will be done to the honest trader. If respectable men are found engaged in this business, it will soon destroy all respectable traffic in such articles. The character of the dealer is now the only security of the public. If this is overthrown, it will be regarded in the same light as dealing in gambling tools. Indeed we scarcely know which is most degraded, the corruptor of the kind referred to, who essentially destroys the crops of the country, or he who provides the means for wasting them in games of chance at the gambling-table. The latter is on better ground than the former, in one respect. The gambler does not destroy or annihilate, so much as he fraudulently acquires the property of his neighbor. We hope our neighbor will not rest quietly under this severe charge.

THE CORN CROP—THE GREAT STAPLE.

Our readers need not be reminded of our views on this subject. We regard this crop as by far the greatest, when we consider its profit to the producer, and no crop can be considered superior to this, in respect to its general utility. Our views are well-expressed in the following article which we find in *The Soil of the South*, which, by the way, is one of our best exchanges. It is original in the *Civilian and Gazette*, which we have never met with.

"Plant Corn."

This laconic sentence, uttered by Gen. Houston in 1842, in reply to the appeals made to him for counsel, during one of the most gloomy and trying periods in the history of Texas, ought to be adopted as the motto of the State. To Gen. Houston's military career Texas owes much—probably her very existence as a nation and State; but she owes him no less for his exertions to consolidate her government and secure for her the blessings of peace; to promote order, system, industry and prosperity among her people. All of mere military glory which any man can gain is as nothing compared to the merit which attaches to those who

> "Scatter plenty o'er a smiling land,
> And read their history in a nation's eyes."

It is not enough that Texas can surpass every other State in the production of cotton and sugar. So long as corn is worth a dollar and a half a bushel in the Galveston market, and is brought here at that rate for transportation to the interior, (as it has been within the past two weeks,) the production of even cotton and sugar will be a poor business. In order to the most successful production of other articles, a people must first secure the means of cheap living. If corn is abundant and cheap, meats, and all other necessary articles of subsistence, will be comparatively easy to obtain. If corn is scarce and high, the reverse will follow. The fear of an over-supply of corn has been the great drawback to Texas thus far. It is true that, in the Western States, corn has sometimes been so abundant as to appear almost valueless, but this very fact has made the Great West what it is—the most progressive and prosperous country that ever existed. Notwithstanding the immense supply of Indian corn it has always been usefully employed, and the demand has outgrown

the increased production. Recent events have drawn the attention of political economists strongly to this subject, and led to the clear establishment of the fact that corn is by far the most valuable crop in the United States, and that its importance is constantly increasing, while, from the deterioration of the soil and other causes, both corn and the supplies of other articles depending upon it, have greatly fallen off in some of the older States of the Union. Its cultivation is mainly confined to a belt of thirteen degrees. The last census shows that five States, including Western Pennsylvania and Western Virginia, in the valley of the Ohio, furnish half the amount produced in the Union. Though cotton has increased, it has not half so rapidly as maize. The latter is destined to become the great staple of commerce. The climate in Europe is not adapted to its cultivation, and foreign demand is on the increase. It is estimated that 50,000,000 bushels, or 1,500,000 tons, are transported annually in bulk, within the States. 3,000,000 hogs are prepared for market every year, of which 2,000,000 are fatted on corn, consuming 200,000 tons. The manufacturer of 600,000 barrels of whisky consumes 100,000 tons. 170,000 tuns are used in cattle feed. The aggregate amount for 1849–'50 is two million tons. According to the current increase, in 1860 nine hundred millions of bushels will enter into commerce, or three million tons, which will furnish exclusive employment for 4,000 miles of railroad. The demand for corn and animals depending upon it is rapidly increasing within the State. It appears that in Kentucky and Tennesee, there has been a great decrease in cattle in ten years; no less than 33,786 of neat cattle in the former, and 72,066 in the latter State. It is stated on the best authority that in Massachusetts, from 1840 to 1850, the hay crop had depreciated 12 per cent., although 300,000 acres had been added to those previously under tillage. The corn crop during the same period fell short 6,000 bushels; there has been a falling off of 160,000 sheep and 76,600 swine. In the State of New-York from 1845 to 1850, 671,692 acres were added to those previously under cultivation, and yet there had been a most alarming falling off in all kinds of agricultural products. The same is true of most of the old States. All these deficits must be supplied from the new States of the South and West. Texas beeves have already found their way to the New-York market. They are still needed, not only there, but throughout the Union. Texas horses, mules, sheep, and hogs would find an equally ready sale, especially if the breeds were a little improved by feeding with corn. These animals have, thus far, been raised here on the spontaneous productions of the soil, and without cost to the owners. Feeding during winter would produce much better stock, and still enable our farmers to undersell those of any other State. According to the best accounts, two years ago, and before the present era of high prices set in, the expense of raising a horse in Indiana, until three years old, was $30; in Kentucky, the cost was from $40 to $45, and its value from $70 to $150; in Maine, the cost till four years old was $60, and the price $100 and upwards; in Missouri, the cost was from $18 to $20, and average price $100. The cost in Union county, Pennsylvania, was from $60 to $80, and the price $125 to $150. In Schuylkill county, the cost is $35 to $45 a year till two and a half years old; after that he will cost from $50 to $60. He will sell from $100 to $230. Corn is not likely to prove a burden so long as it can be converted into horses at these prices; or into pork at from $16 to $20 per barrel.

Late as is the present season, it may yet prove exceedingly profitable to follow the advice at the head of this article.

MEMOIR ON THE PRODUCTION OF BUCKWHEAT.

Buckwheat was introduced into France in the eighth century by the Saracens, in the time of their invasion into that country, and has preserved its name (Sarrazin) from this people, as it has in Poland, where it was introduced by the Tartars, six centuries afterwards, where it is called Tartarka. It is not a cereal, as is generally supposed, but it is now placed by French botanists in the same class as cabbage.

There are two kinds of buckwheat; the common, and the buckwheat of Siberia, as it is called. These two kinds differ very much. The former is more farinaceous than the latter. Prepared with the hull, it is sweeter, and does not heat so quick, as it is less resinous than the other kind with the hull. The taste is more bitter; but as it does not heat so quick, it may be kept a long time. The latter sort, however, is preferred. Two crops of this can be grown in a season, since neither frosts nor hot winds injure it; and it produces fifty, one hundred, and even five hundred fold, while that just named does not produce more than twenty or thirty to one.

The Tartars did not employ the first, as they did not use the farina, but hulling the grains, they used them as they do rice, boiling them in water or in milk. The process of hulling was performed without the use of a mill. Boiling water was poured upon the grains, and after standing an hour, the water was poured off, and the grains were dried by the fire, or in the sun; and after the grains were dry, they were placed between two sheets, and rolled with a wooden roller, by which the hulls were separated from the grains. They were then fanned, and were ready to be cooked. What is surprising, as the result of this process, is, the grains were kept distinct from each other, while those hulled in a mill and cooked, became compact and adhesive.

The people of the East make delicacies from the meal of buckwheat, which is called *ble mondé*, or pealed grain. Open the Thousand and One Nights, and at the splendid banquets, among the most choice dishes served upon the table of Haroun el Raschid, Caliph of Bagdad—were the Bermacedes or ragouts of mutton—served with the meal of the monde; that is, of hulled buckwheat.

In Poland, with the aid of a mill, we find buckwheat not only in the form of, coarse meal, but also fine white meal, which is the same thing as the farina of Hecker, manufactured in New-York.

In Germany, as in Poland, this is well known as a healthy and light nutriment, and is used in the confection of sausages with pork, mixed with the muscle and the fat.

The Hollanders make much account of semoulie, or fine meal, which is a source of great profit, and an article of commerce with China, and is there well-known under the name of small European rice. Lord MacCarty, ambassador of England, in that country, reports that a dish offered him by the Chinese, in the name of the Emperor, as a mark of distinction, was nothing else but the meal of buckwheat.

France harvests more than 5,000,000 hectolitres of buckwheat, (a hectolitre being a little less than three bushels,) and of 35,000,000 inhabitants, two and a half millions live chiefly on this production. They use it in the form of farina, of which they make a porridge, of pancakes and of bread, but for the last it must be mingled with the flour of barley or of rye. It is thus

made as black as the soot of the chimney. It is dark colored because the grain is mixed with it without hulling.

M. Felix Didier Saniewski, (the writer of this memoir,) a Polish refugee, after the revolution of 1830, having resided in France for five years, perceived that the proper use of this grain was not understood, and constructed a mill of brass, of which the following is a description:

The mill presents a total elevation of a metre and forty-five centimetres, (a metre is a little more than a yard.) The base is of plank, sixty centimetres on the sides and ten centimetres thick, supported by three feet of forty-five cents. in height fastened into them, and supported by cross-pieces. Upon the plateau or base, rests the lower stone, ten centimetres thick, lying horizontally. This millers call the bed. It is enclosed in a casing to the depth of five centimetres. The second stone is of the same thickness. It lies upon the first, and is supported by iron-work, as is seen in ordinary mills. The two stones are forty-two centimetres in diameter. An opening is made in the upper stone for the admission of grain, ten centimetres in diameter. The base is surrounded with four planks, which form the sides, and which millers call the frame. This extends to the height of five centimetres above the line of the junction of the two stones, and are four centimetres in thickness, making the total dimensions seventy centimetres. There is an opening in the said frame at the same level as the base, to admit of the discharge of the farina. Finally, two uprights or posts, ninety centimetres in height, and fastened to the frame at their extremities by a cross-piece four centimetres in length, which is pierced in the center. Through this orifice a spindle passes, one metre in length, ironed and pointed at the lower extremity. From this opening there passes obliquely a lever, which may be applied to one side of the stone by means of a mortice made in the stone itself, by which the miller moves the stone to the right or to the left.

Not having been a miller, and not knowing, except by observation, the process of preparing the various kinds of food made with buckwheat, by the aid of this mill, which cost twelve dollars, he commenced his experiments, and engaging with a miller of Saint John, of Ruelli, near Orleans, at the commencement of 1836, he ground three hectolitres of buckwheat, and having converted this quantity into coarse meal, he sold it in the markets of Orleans and of Paris at six sous (cents) per French pound, while the same thing imported from abroad had been, before this, sold to "amateurs," for eighteen sous per pound.

It was impossible to obtain, by a large mill, this meal, (semoule); and hence it was necessary to have recourse to his small mill; and after having constructed a bolting-cloth of fine silk, he obtained the most beautiful farina, which was sold at Paris as it had been prepared in the provinces.

Afterwards he presented to the Minister of Agriculture a memoir on this subject. In the years 1837–8, different agricultural societies examined his processes, and reported upon them. At the exhibition of products of 1839, at Paris, he obtained "an honorable mention," and the report of the jury declared that he merited a reward of the first rank, but in consequence of the limited extent to which these labors had been performed, the award could not properly be made. In 1840 he published a memoir upon the products of buckwheat; and in 1842 he went through the departments and instructed the inhabitants how to obtain them, not only by aid of his small mill, but also by using a Holland mill, as well as the mills already in use, in grinding wheat. In 1841, at the exhibition of four departments at Tours, a medal was awarded to him for these services.

He arrived at New-York in 1851, and having noticed in the shops the show of Hecker's Farina, and curious to know what it was, he purchased a pound of it, and having considered it very carefully, he was satisfied that it was the self-same thing as his *semoule*, or the fine meal of buckwheat. Afterwards, passing through Forsyth street, he perceived in the window of a baker's shop a larger loaf of farina not bolted, which he bought on account of its resemblance to that used by his countrymen in Poland. In eating it, he discovered the hull of buckwheat. The baker was a German, and M. Saniewski, understanding his language, inquired of him where he obtained the farina for the manufacture of that bread. The answer was, at Hecker's, in Cherry street. He then visited this mill, and found a clerk who spoke German, with whom he entered into conversation concerning the farina of Mr. Hecker. He commended its excellence, and then, as a stranger, expressed a wish to see the mill. The clerk replied that this was not permitted; that it was a secret which could not be made known to strangers.

As his children had been accustomed to this kind of food in France, and as it was light, convenient, and easy of digestion, he often purchased this farina, and prepared it as he had been accustomed to do, without regarding the directions upon the envelope, especially as neither himself nor the members of his family knew the language. But a while afterwards, having repeatedly bought this farina, he perceived that it had a different taste and a yellowish color after it was cooked, while it had been white; that it was not so compact, and had less adhesion. He then examined the farina as it was bought raw in the package, which he found of a yellowish color, and having tasted it, he was satisfied that it was the farina of wheat as it was used in France. This could readily be perceived, as the difference was obvious after it was cooked, as it is milder (plus liante) than pure buckwheat. This is caused by the fact that wheat contains gluten, while buckwheat does not, which has only albumen, and is more binding and sweeter. In cooking the two another difference is perceived; for when the meal of wheat is thrown into boiling water and is not stirred diligently, it will form a compact mass, which is not in the condition of separate grains, as in the case of buckwheat, although the latter will also form a paste, but when the water is drained from it, and it is removed into a colander, it separates itself into grains. Hence while it is easy to distinguish the one from the other, it is evident that Mr. Hecker uses wheat; first, because there is not a sufficient quantity of buckwheat grown to provide for so extensive a consumption; second, the buckwheat costs more than wheat; third, there is more profit from a given weight of wheat than from buckwheat; fourth, the labor of preparing buckwheat is more expensive; and fifth, the gain is greater.

But to the consumer these two are not the same thing, as the buckwheat, being destitute of gluten, is light and easy of digestion for the dyspeptic, is wholesome for children, and those who cannot eat almost anything else, find no trouble in the use of this. Of this I have had proof from Mr. Mansel, Prefect of Maine and Loire, in France, who was dyspeptic to the last degree, and was given up by his physicians, who having recourse to the pure meal of buckwheat which he purchased of me, after some months, in which he exclusively used food prepared from buckwheat, became so much improved that he could digest any kind of food, and his health and strength were completely restored. The flour of wheat was at the same time injurious to him, and the use of it had nearly cost him his life. Wheat is also injurious to children.

The meal of buckwheat is a wholesome diet; but it should not be mixed

with other ingredients, as pounded rice, nor substituted for that of wheat, as, in my opinion, this is a want of good faith to the consumer. To extend the use of this wholesome food, it is necessary that all should know how to prepare it, and that farmers who grow this crop would obtain a greater profit who sell it in the grain, as I have shown above; and I recommend the use of the simple mill, already described, with the following additional conveniences for its manipulation.:

A pan or sieve, or a light trough, oblong, and dug in a semicircular form of common wood, which may be used in winnowing the grain; a sieve through which after the grain is ground the coarse meal, the flour, and the farina, as well as the particles of the bruised grains, may be collected. Three sieves are needed, two of moderate fineness, and one finer at the bottom, made of silk, after the manner of bolting-cloths, or of fine muslin. This is all that is required.

The manipulation is as follows: The buckwheat should be cleared of all gravel; the upper stone is raised by the aid of a screw, which is introduced into the lower stone, and when the grain comes from the mill broken, and passes on to the sieve, giving it a rotation by which the hull rises to the top, and is removed by a stroke of the hand, and is thrown away as useless. Since the light hull will remain on the sieve with the coarse meal, this must be fanned, and that which can be scattered by the wind is driven away, and the pure meal will remain. But it is still necessary to give a blow with the hand upon the sieve, and separate the particles of flour from the hull by this process. The residue which is separated by the wind from the meal is nutritive, but excites heat, although for horses it may be very useful when wet or salted.

The flour and the farina which shall remain at the bottom of the sieve is passed over the sieve, and the farina and the very fine particles of the hull are separated from the semoulé, and it is necessary still to keep the fan in motion. The particles that are found mixed in the flour will rise to the top, and may be brushed away with the hand, and thus the semoulé will remain pure, and fit for commerce or domestic use.

To turn the mill, the strength of a boy of twelve years old is sufficient, and the clearing may be done by the hand of a woman, since it is very light work, and females are especially adroit in this kind of labor. And then, when the mill is to be set away, it may be placed in one corner of a chamber, or in the hall, or in a granary. It is exactly the work for a farmer on a leisure day—being light, useful, and profitable.

If a coarser meal is desired, and it is to be preserved a long time, as on a long voyage, it is necessary to dry the buckwheat before a fire. The manipulation is the same. I have had experience of this in France, having left two sacks of this meal for two years in a moist place, so that the sacks were partially decayed, but on removing those portions of the meal that were particularly exposed, I dried the remainder in the air, and found that it had not lost its flavor.

All these varieties of flour may be obtained with an ordinary mill, but the stones should be very hard, and in good condition. I have had repeated proof of this in France, with the mills of Brittany and of Normandy. But for the wealthier farmers, and those who would make much account of these products, we recommend the Holland mill, which grinds, separates, cleans, and then delivers the products desired. It costs one hundred dollars, but lasts an age. The following is a description of it:

[We shall give this description when we can procure an engraving of it,

that it may be better understood. If any are desirous of trying it, we will communicate to them personally such an exhibition of it as may answer the purpose.—Ed.]

I do not know, but I presume that the mill of Mr. Hecker is of this description. The description and the design, connected, were given in my memoir upon the use of Buckwheat, published in France, in 1840. One reason why I entertain this belief is, that the mode of using Hecker's farina, written in his directions, is an extract from this memoir, (p. 71,) under the title *La Semoulé.* Changing the name of a product does not change its nature.

Having indicated the manner of preparing these products, I would give some idea of their value.

Extract from the Report of the Commissier of the Society of Agriculture of Blois, August 25th, 1837: "That the value of the new products which we have discovered may be properly understood, and in what proportions they are to be obtained, we take in our first experiment five pounds (French) of buckwheat, which gave—

Meal, (gruau,) - - - - - -	1lb. 12oz.
Farina, - - - - - - - - -	4½ "
Waste, (recoupe,) - - - - -	1 " 12 "
Bran, (sou,) - - - - - - - -	14½"
Loss, - - - - - - - - -	5 "

In our second experiment, 32 pounds 8 ounces reduced to 31 pounds 3 ounces by cleansing, (the grain being mixed with gravel,) the result was—

Coarse meal, - - - - - -	8lbs. 4oz.
Fine meal, (semoulé,) - - - - -	4 " 4 "
Farina, - - - - - - - -	4 " 8 "
Waste, - - - - - - - - - -	3 " 12 "
Bran, - - - - - - - - -	8 " 8 "
Loss, - - - - - - - - - -	2 " 4 "

Notice how I have proved the correctness of my calculations.

Cost of four bushels of buckwheat at 95c.	$3 80.
Expense of preparing it, (a day's work,)	$1 50
Total,	$5 30

Product of four bushels of the grains weighing, after cleansing, sixty pounds:

Coarse meal,	16lbs.	at	30c.	$4 80
Fine meal,	6 "	"	35c.	2 10
Farina,	6 "	"	15c.	90
Bran,	13 "	"	5c.	65
Waste and loss,	19 "	"		00
	60lbs.			$8 45

From this it is obvious what large profits a farmer can secure to himself by preparing his own buckwheat; and I add that the bran is good feed for horses and for swine, while the hulls which he will throw upon his dung-heap is good and nutritious feed for hens and ducks.

I will not speak of the great profits which Mr. Hecker obtains from buck-wheat in selling it at one shilling a pound, nor of the monopoly which he has secured of this crop in this section of country, which has raised the price of buckwheat from three to six cents a pound, at the cost of the consumer.

(*To be concluded in our next.*)

NEW-YORK AND ERIE RAILROAD.

A LEISURELY trip over the eastern half of this great road, is an event of great interest and pleasure, as we can personally testify. One thing strikes all travelers early and obviously, the kind and gentlemanly bearing and manners of the superintendent, Mr. McCallum, and his assistants, one of whom, Mr. Hugh Riddle, is in Port Jervis, and has the care of the road from that place to Susquehanna Depot; and this first impression is in no danger of being removed by a more intimate acquaintance either with mechanics or engineers. Another thing which will impress and please the leisurely traveler, is the perfect system which marks the management of the road, from the matters of greatest importance, to the minutest matters in the workshops and around the stations, which enables few men to do the duties which otherwise would be less perfectly done by many, and which awakens a feeling of conscious safety, and excites a friendly sympathy in the mind of the traveler. The repairs for two sections of the road are done at Susquehanna depot, where locomotives are repaired and rebuilt; two hundred men are employed there, and four hundred can be, when business demands the labor of so large a number of persons. Ms. Gregg is the master mechanic. For making and mending wheels, boilers, cylinders, and all other parts of some ten dozen locomotives, turn-tables, round-houses, machines' tools and so-forth, must all be on a great scale, and to manage all the men and work so as to have neither material nor time lost, requires the most skilful, constant, and systematic care. Such is the management of an establishment of such gigantic size. An hour or two under the pilotage of Mr. G., and in free conversation with foremen and subordinate masters, will teach a valuable lesson on kind, exact, and successful management. The lessons of the turn-table and round-house are soothing to nervous people. The way in which the engine is inspected, after "walking over the section"— all around it, and over it, and before and behind it, and in "its joints and articulations," and how every separate part is thumped, handled, cleaned, and made just exactly right, and put exactly in its place; the way this is done all the time, and everywhere, puts the nervous passenger in perfect quietude, and fits him to enjoy the grand, beautiful and sublime scenery lining the sides of the valleys through which the road passes. That scenery, by the way, a man must enjoy in spite of himself; who starts, for instance, from Susquehanna for New-York at 6½ o'clock A. M., on a bright morning in June, and, having had an agreeable interview with himself before starting, takes his seat in the aft end of the aft car, and gives himself up to observations and reverie. Beauty, grandeur, sublimity and youthful freshness in nature everywhere and variously greet him as onward he goes, over the hills and over the valleys in delightful haste, and safety towards New-York. Amidst the most rocky and rugged scenery, the stupendous works of men join with nature in awakening a traveler's wonder and admiration; for, while the road for the engine and his truck has been excavated from the primitive rock on one side of the now calm and now roaring Delaware, across the bosom of said stream, and also excavated from primitive stone, is seen the Delaware and Hudson Canal, whose placid bosom glistens like a silver band along and around the bald black base of the approaching mountain. The road, and river, and canal down at the bottom of a broad ravine, make a grand and sublime impression, every way suited to harmonize with the impression of that charming cascade, a long ways back, which surprised and de-

lighted you by the free and easy way its waters plunged over a high precipice down into an abyss dark as midnight. Nowhere can be found such a railroad scenery. Some experience enables us to speak intelligently in reference to a desirable trip over this road, to take which entitles any man to receive our congratulations.

We hope to be able to make a more extensive report, ere long, of the beautiful scenery along this immense thoroughfare. M. M. D.

INGENIOUS BRIDGE.—A small apparatus for crossing a canal and tow-path, came lately under our inspection in Port-Jervis, N. Y., and we were so much pleased with it, that we attempt a description of it for the benefit of whom it may concern, stating by the way, that one of our friends, Mr. L. H. Beckwith, is the inventor and owner of the bridge we saw. It is built, first, by erecting two posts, each about twenty-eight or thirty feet high, one on the outer edge of the canal, and one on the outer edge of the tow-path. From the tops of these posts wires are fastened and stretched outward at an angle of some forty degrees, and made fast to a tree or post. From the top of each post a wire is fastened, and stretched inward across the canal, and inserted and made fast to the opposite post, just four feet from its top. Another one, perpendicular to the face of the canal, made to roll upon the upper wire by a pulley attached to the upper end of said wire, hangs down to within four feet of the ground, and has a loop in its downward end, of size and strength to admit a foot. Hence to cross the canal, put your foot in the loop of the wire pendent from the higher transverse wire, and also grasp it in your hand and your weight carries you over the water safely. Before starting, grasp also the wire hanging from the lower transverse wire, and slip or trundle it across with you, that you may use it in returning. The wire is about three sixteenths of an inch in diameter, which is used in the construction of Mr. B.'s bridge, which is to him very convenient, and which is a contrivance of much ingenuity.

MECHANICAL STATISTICS.

PORT JERVIS, N. Y.—*Saw-Factory* of James H. Mondon & Co., owners and agents. Shop employs 16 hands on an average; make cast-steel saws of all kinds, taking the steel in sheets.

Machine-Shop included, has J. B. Crisman, foreman; has 3 lathes, and other tools in proportion.

Neversink Foundry, by Van Fleet, Bull & Co., employs 20 hands on an average, running two tons iron daily.

Machine-Shop attached, has 5 lathes, and other tools in proportion.

Repair-Shop of New-York and Erie Railroad.—This shop is one of the smaller ones belonging to this road. George H. Hoagland, foreman. Shop has 6 lathes, and other tools in proportion. Repair locomotives.

Carpenter's Shop, A Wood, foreman.

Car Inspectors, C. D. Cooper and W. E. Cooper.

W. H. Lamoreux, Wm. J. Hull, Edward Merritt and others, Engineers.

Hugh Riddle, Esq., Superintendent of Delaware Division of Road.

SUSQUEHANNA DEPOT, PENN.

Repair-Shop of New-York and Erie Railroad.—James B. Gregg, mas ter mechanic; A. King, General, and Robert Wallace, Assistant Foreman George Pettit, Dispatcher.

Machine-Shop has lathes, planes, etc., 46, and other tools in proportion.

Largest lathe has face-plate 8 feet in diameter. John Wood and R. F. Brown, Foremen.

Forge-Shop has 2 trip-hammers, 26 fins; Wm. Hunt, foreman.

Connecting-Rod Shop, John Durling, foreman.

Pattern-Shop, William Nugent, foreman.

Print-Shop, John W. Smith, foreman; John T. Bourn, store-keeper.

Foundry, has Samuel Falkenbury, foreman and 14 hands on the average. Frederick Avery and others, engineers.

This shop does the repairs on 105 locomotives, all used on two divisions of the road.

Two new engines of extraordinary power and simplicity have lately been received, built for the road, after the ideas of Mr. Gregg. They have 5 feet driving-wheels, cylinder 17 by 24 inches—outside connections—1100 feet heated surface, 8500 pounds traction—66,000 pounds weight; 40,000 being on the driving-wheels.

CENTRAL VILLAGE, CONN.

Union Co.—2 mills cotton. H. L. Aldrich, agent.

Old Mill has 18 cards of 36 inches; 3,300 ring and throsele spindles; 84 looms. Cloth is 28x36 inches wide, of yarn, No. 26.

New Mill has 40 cards of 30 inches; 5,500 ring spindles, 132 looms. Cloth 39 inches 72x80; and 36 wide, 60x68; of yarn No. 30. Shepard Dixon, Martin Pierce, Benjamin R. Money, Wm. J. Potter, and others, overseers.

Almyville-Mill—Cotton. Sampson Almy owner and agent.

Mill has 18 cards; 80 looms; 3,448 spindles. Cloth 32 wide, 72x88; and 34 wide; 72x88.

Moosup Mill—Woolen.—E. A. Russell, owner and agent. Mill has 7 sets cards, of 40 strands each, and 47 looms. Make first class fancy cassimeres and doeskins.

Waregan Mill—Cotton.—J. S. Atwood, Superintendent; has 70 cards; 10,500 spindles; 236 looms. Cloth 34 wide, 84x100; and 40 wide, 84x84; of yarn No. 35. Alfred Chatterton and others overseers.

WELDING CAST-IRON.

THE welding of cast-iron, part to part, or a new part to an old one, is done by a process different from the welding of wrought-iron; and yet the process of doing it may properly be called welding. The honor of first welding cast-iron, since the reviving of art, probably belongs to Mr. Samuel Falkenburg, foreman of the foundry attached to the Susquehanna machine-shop of the New-York and Erie Railroad. The process is somewhat as follows: Mr. F. has a pattern made of the casting to be supplied to another given casting, and moulds the casting with the use of the pattern to the imperfect piece. Instead of pouring the fused iron into the mould, and allowing it immediately to cool, the fused iron is permitted to escape by a prepared orifice—the pouring of the fused metal and its escape being continued—until the rough edges of the imperfect piece become fused by the heat of the passing fused iron, when the orifice by which the fused metal escapes is closed, the mould

is filled, and the iron, thus confined in juxtaposition with the melted edge of the unmelted iron, gradually cools and becomes solid. When the sand is removed, the new part is found to be one with the old, the welding and supplied part being perfect. The welding has been most frequently performed upon locomotive cylinders, one part of which has been broken off. It will readily be seen that one great difficulty to be overcome is the difference in the contraction of the new and old parts while they are cooling. This difficulty is greatly diminished, if not satisfactorily overcome, by heating the cold iron as much as may be done before the new metal is poured into the mould. By this means the shrinkage of the old and the added parts become equalized. Many damaged cylinders have been mended in this manner by Mr. F., and consequently much expense has been saved to the road. We are assured by Mr. Gregg, the able master-mechanic of the shop, under whose supervision some one hundred locomotives come, that the welding is perfect and hence satisfactory, though some cylinders have been damaged by having pieces broken out through the whole length, and some also having flanges broken off. Mr. F. has procured no patent right for the sole use of his discovery, yet this acknowledgment is his due—he being the discoverer of the mode of welding cast-iron. This discovery is abundantly sufficient to entitle him to be honored as the benefactor of mankind. The process by which it was reached partakes about as much of invention as of discovery.

PANORAMIC VIEWS AND PAINTINGS.

J. R SMITH'S TOUR OF EUROPE.

"WHO does not believe his own eyes?" "What I see I know;" and other expressions of like import, are heard almost every day. But such phrases do not embody the whole truth. What a man sees is fixed in his mind in definite form. It is bounded by mathematical lines, and by well-defined surfaces. Half the people in the world do not know what they think they do. Ask for a definition of hundreds of words, without entering upon difficult abstractions, like *virtue*, *kindness*, etc., and though they are used perhaps every day in common conversation, you will fail to get correct answers. The definitions may be only imperfect and partial, or even positively incorrect.

We have a system in our own mind in regard to visible illustrations. We would employ them in almost every branch of education for the young and for the old. Who would teach geometry without diagrams? Who would instruct in architecture without drawings and models, and even actual structures? In our view such aids are almost equally essential in geography, history, etc. In botany it is absolutely impossible to teach or to learn merely by definition and explanation. Such studies alone are not worth a mill.

The missionary enterprise, in our view, would be wonderfully benefited could the scenes witnessed by our missionaries be presented before the vision of the people who are called upon to sustain them. Give us such facilities for reaching the hearts of the people, through their eyes, and we need not fear to insure an increase in missionary contributions of one hundred per cent. We have made such statements often in private circles, and some-

times in public assemblies. We must have personal knowledge of the recipient of our charities ere our last coin is drawn from our pockets, and any arrangement which approximates towards this adds to the weight of the motive which operates upon us.

In geography we have tested the powers of the magic-lantern in giving interest to a branch of study in itself as an abstraction as dry as any art of the chemist could make it. So, too, in astronomy. And what would one know of chemistry without seeing experiments?

What is "a knowledge of geography?" A readiness in giving latitudes and longitudes, with certain names of very uncertain forms of mountains, etc.? Not at all. These are but the frame-work. We should know the forms, appearances, habits, manners, dress, opinions, etc., of the people. It is this, and this only, which is worth study. We would see the people, see their houses, their public buildings, etc., and extend this kind of instruction in the greatest possible degree.

Views of cities, mountains, cataracts, etc., are interesting to all, learned and ignorant, young and old, and give a zest and a reality to less *material* topics.

J. R. Smith's Pamorama.

We were led into the preceding train of remark by witnessing the views of various European cities, now on exhibition in this city. As a mere work of art, Mr. Smith's Panorama of European cities, etc., is the finest we have ever seen. Such effects could only be produced by a skillful hand. The perspective, in which so many fail, is preserved throughout, with scarce an exception even in minor points. The coloring, shading, etc., are admirable. So, too, the selection of scenes presented is very judicious. There is much meaning in a remark in a little descriptive pamphlet which Mr. Smith gave us, in which he says, "Leghorn is a fine place, but not for a picture." He has presented us good pictures. We would not like to dispense with one of them, but with the young pupil of Master Squeers cry "more, more." We have capital views of Rowen, Paris, Brussels, Hamburg, Berlin, Milan, Venice, Florence, Rome, Naples, etc., with various castles, cathedrals, palaces, monuments, churches, etc., mountain scenery, views on the Rhine, volcanoes, and other natural objects; every one of which is worthy of careful study, and which exhibit capital judgment in the artist. Besides this, we are satisfied that the views are true to the reality. The single view of the great cathedral of Milan by night, lighted, and filled with people, is fully worth the price of a ticket. So is the night view in Hamburg. So is the view of Heidelberg castle. Several glaciers are included in the views of the Alps, which teach better than any geography can, the various forms and appearances which they assume. We know of no better method of giving interest to studies of this sort than by such representations. Had we a class in geography to instruct, we would take them to such an exhibition as this, even at our own cost. Even ordinary engravings are better than nothing. Well-made panoramic views are second in value only to an actual visit to those places, and almost all of us must confine our foreign tours to the halls where panoramas are exhibited.

But we would say a word more of this work of Mr. Smith, as a work of art. We should like to know how all the capital illustrations of day and night, moonlight, the light of conflagrations, the twinkling of stars, the sparkling of crystals in caverns, etc., etc., can be represented in a style so splendid and so true to nature. Perhaps we can get admission to these secrets. If

so, we will tell you, kind reader, all we are permitted to. The thunder and storms, and even the roar of the batteries before Sevastopol, belong to a humbler department of art, and are properly introduced into such representations rather to relieve the observer, and prevent weariness from a constant tax of eye-sight, than for their literal resemblance to the tempests of the outer world. Of the reliabilility of these representations we have evidence in the fact that the views were taken on the spot, and have been successfully exhibited in several European cities. The views of Sevastopol are taken from the drawings of the French engineers.

The style of painting in a panorama is peculiar. A mere portrait-painter could not succeed in it. An artist quite skilled in common landscapes would need some experience in this particular branch of the art. The scene-painter, who so much increases the interest of dramatic representations, boasts an art peculiarly his own. It is unlike all other styles of representing nature, and most emphatically so when most true to nature. The artist who produces a good panorama, possesses an art scarcely less distinct from all others than does the dramatic painter.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

COMPANY OF INVENTORS.

SIRS :—I gladly avail myself of the opportunity you offer, in your July number, to propose myself as a candidate for membership of a Company of Inventors, on the plan you propose, should the plan meet with such general favor as to bring together a number sufficient to be effective.

Several attempts have been made to form associations of Inventors ; but none that I know of that proposed to make inventions help each other in the way you suggest. They were rather designed to obtain amendments of the patent laws ; and examine and certify as to the merits of inventions, so that capitalists might rest assured of the safety of investing money in them, and the inventions, thus endorsed and aided, might speedily become profitable to all concerned.

I have little hope from attempts of this kind to amend the patent laws ; still less hope have I that examinations and reports will influence capitalists. Inventors themselves, generally, have been obliged to demonstrate the utility of their own inventions, before capitalists would engage in them ; and such will continue to be the only course until science is more generally taught than it is at present.

But a combination, by which the force of a number could be applied to one invention at a time, would excite hope, and induce inventors to make the advances needed, for the sake of having the like aid, sooner or later, and the profit they might reasonably expect from their own judicious choice of the inventions to which they could appropriate their funds.

I would gladly avail myself not only of the capital which such a company might appropriate, but also of the talent that would probably be offered, on the conditions proposed, namely, that the profits resulting from such joint labor and hazard should be divided, by disinterested judges, among those who had contributed to the result. My improvement in the steam carriage, if it

have the aid, instead of the rivalry of the inventive talent of the country, will, I am confident, produce money enough to enrich hundreds; yet if left to the judgment of capitalists, it may be a long time before it is brought into use. I have always hoped to concentrate in one powerful company all the improvements that may be made in this invention, and to make it for the interest of every inventor to work with me, and not against me; and I cordially invite such coöperation as you have proposed.

The approaching fair of the American Institute at the Crystal Palace, will afford an opportunity to organize such a company. Meantime, I hope you will receive the names of many inventors, and many enterprising capitalists, as members of this proposed company. Yours respectfully, J. K. Fisher.

PRESERVATION OF MILK.

The following method of preserving milk for any length of time is found in the *London New Monthly Magazine*. It looks to us rather a dubious process, but we should like very much to have it tried, and the results reported to us. If successful, this is of very great value for ships at sea, and for all in warm climates.

"Provide pint or quart bottles, which must be perfectly clean, sweet, and dry; draw the milk from the cow into the bottles, and as they are filled, immediately cork them well up, and fasten the corks with pack-thread or wire; then spread a little straw on the bottom of a boiler, on which place the bottles with straw between them, until the bottles contain a sufficient quantity. Fill it up with cold water; heat the water, and, as soon as it begins to boil, draw the fire, and let the whole cool gradually. When quiet cold, take out the bottles and pack them in a cool place.

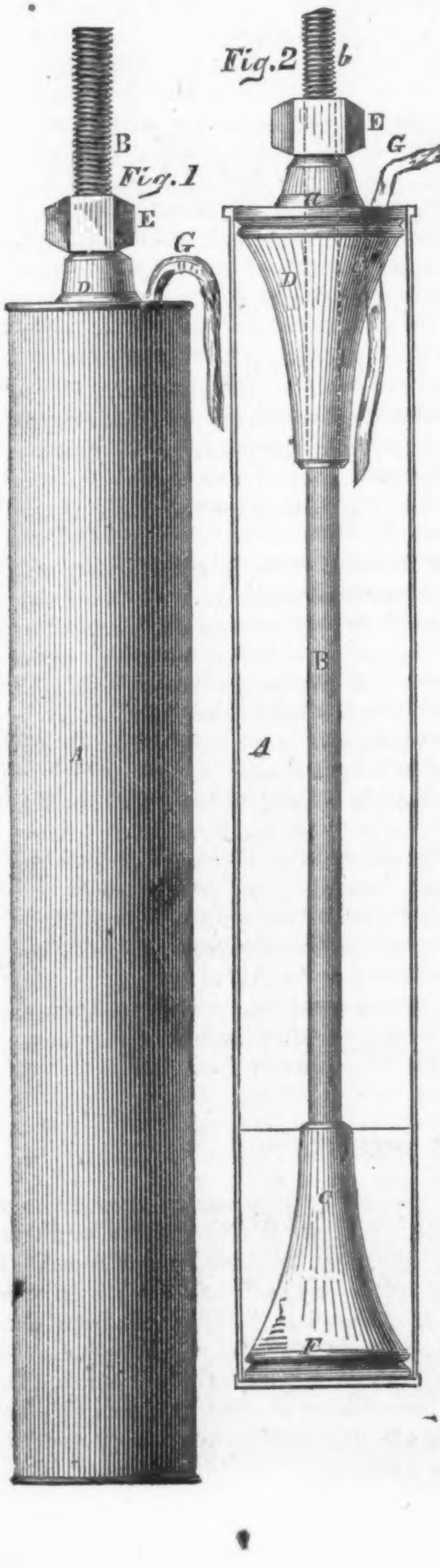
"Some years since, there was a Swedish or Danish vessel at Liverpool, having milk on board, preserved in this manner. It had been carried twice to the West Indies, and back to Denmark, and been above eighteen months in the bottles; nevertheless, it was as sweet as when taken from the cow."

On this subject the editor of the *Chemist*, in the May number, remarks:

"We lately tasted, at the Royal Institution, milk preserved by Mr. Mabbrun's proeess, and which had been presented by the Abbe Moigne to Mr. Barlow, who alluded to it in his lecture on preserved meats and vegetables. This milk was one year old, and was as sweet as when first drawn; a considerable quantity of cream had collected in the necks of the bottles."

Fall River Route to Boston.—We have again had occasion to send two ladies of our family, unattended, over this route. We never feel regret on account of such necessity, for we know they will be well cared for. A letter received from them, after stating sundry particulars, says: "You must puff this line handsomely, for they richly deserve it." Especial reference is made in it to the clerk, and we have ever found him prompt in business, careful in his especial trusts, particularly attentive to those who make known their wants, gentlemanly and kind to all. Capt. Brayton is a model commander. The whole arrangement on board is judicious; the tea-table superior to that of any other line, and the servants are attentive and courteous.

ROCK BLASTING.



The annexed figures are views of an an improved implement for blasting rocks, for which a patent was granted to Capt. C. F. Brown, of Warren, R. I., on the 11th of July last.

Figure 1 is an external view of the implement, and figure 2 is a vertical section of the tube which contains the charge. Similar letters refer to like parts.

This invention relates to a new and useful implemement for blasting rocks, and consists in placing the powder or charge within a tube or case, between two heads provided with suitable packing, and attached to a rod, by which arrangement the charge is prevented from "blowing out," or obtaining vent in the direction of the line of the hole in which the tube and charge are placed, and the whole effect of the charge is exerted against the sides of the tube or case.

A represents a tube or case constructed of sheet metal, paper, or other material; B, figure 2, represents a metal rod having a conical metal head, C, permanently attached to its lower end. The diameter of the base of the head B, corresponds to the diameter of the bore of the tube or case; D is also a conical metal head, placed loosely upon the rod, B, in in an inverted position, the rod passing through a circular hole, *a*, which is made longitudinally through the center of said head, represented by dotted lines, figure 2. On the upper part of the rod, B, a screw thread, *b*, is cut, and a nut, E, works thereon. F F are metalic rings which encompass the heads near their bases, and serve as packing; G is a piece of fuse, the lower end of which is attached to the small end of the head, D, and the upper end is passed through an ap-

erture, *c*, in said head, and projects a suitable distance above the tube, A. The implement is used in the following manner: The rod, B, is inserted within the tube, A, the head resting upon the bottom of the tube. The necessary amount of powder is then poured within the tube: the head, D, is placed down upon it, and secured at this point by the nut, E, which is screwed down against D. The space within the tube between the two heads, C D, is therefore filled with powder, and the tube is inserted within the hole which is drilled in the rock in the usual manner, the diameter of the hole corresponding to the diameter of the tube, A; the fuse, G, is to be sufficiently long to reach the top of the hole. The powder being ignited by means of the fuse, the rings, F F, are forced tightly between the heads and the tube, and effectually close the top and bottom of the tube, and as the powder, when ignited, will act with equal force against each of the heads, C D, it is evident that no vent can be obtained in a direction in line with the hole in the rock in which the tube or case is placed, or as commonly expressed, the charge cannot "blow out," and the whole effective force of the powder will be exerted against the sides of the tube, and the splitting of the rock rendered certain. The heads are made of conical form in order to deflect, and thereby diminish the force of the power exerted against them. The packing, F F, may be formed of rings similar to metallic packing of a piston for steam engines. The rod, B, should be sufficiently thick to prevent breaking, and to resist the force of the power exerted against them. The above implement is effective, and rocks may be blasted with much greater facility than by the ordinary mode, no tampering or packing of clay being necessary to confine the powder within the hole. The implement may be used repeatedly, as it cannot be projected to any great distance from the spot where used.

The packing-rings, F F, may be entirely dispensed with by using a small quantity of sand, say sufficient to come near the top of the conical head, then pour in the powder on top of the sand, then insert the fuse, and pour a small amount of sand upon the powder as directed above, taking care that the fuse has entered the powder. The head, D, is placed down and secured by the nut as described above.

Sand is better than the rings, and the implement should be washed after using. The readers of this journal may be assured of the excellence of the apparatus, as tested by repeated experiments, witnessed by many competent judges. Any further information may be obtained by addressing the inventor as above.

PEAT COAL AS A SMELTING FUEL.

THE intrinsic excellence of the fuel producible from our waste peat bogs, induced us to write, so far back as 1846, that "we should one day be able to manufacture, if not coal, as at present dug from the bowels of the earth, at least a fuel equally useful for all the purposes to which the former is at present applied." Since this early date, it is true that nothing has been done on the large scale to render waste bog an industrially valuable fuel; but abundant proof has been given of the truth of our original observation. The nine years' interval has witnessed the manufacture of a fine, hard, and rich fuel, far superior in many points to the best pit coal, both as a smelting material, and as a fuel for numberless industrial pursuits.

To accomplish this, the work of many minds has been required, and many varieties of rich carbonaceous material have been developed during the prosecution of the search. But amongst the most persevering and successful promoters of the pursuit, we have to rank the Messrs. Gwynne, of Essex Wharf, London, who have originated and apparently perfected a system of making a solid carbonaceous fuel, and have, besides, satisfactorily applied it in the manufacture of iron.

Dr. Letheby, of the London Hospital, has examined this fuel, and he reports most favorably upon it. The specific gravity of the block on which he operated, was 1.14, its structure being very hard and dense. The actual stowage weight of a cubic foot was 71.24 pounds, whilst Newcastle coal is about 49.69 pounds only. One hundred parts of the fuel contain nine of hygroscopic moisture; and they yield 55 of volatile matter, much of which is condensible, and thirty-six parts of charcoal. The charcoal contains 3.8 of ash.

In submitting one pound, or 7000 grains, of the fuel to distillation in an an iron retort, the resultant volatile products were conducted through a red-hot iron tube, in the hope that the paraffine of the tar would be decomposed and converted into a gaseous hydro-carbon of high illuminating power. The results of this treatment were 2520 grains of charcoal, 1320 of ammoniacal liquor, 360 of thick tar, and 2800 of combustible gas. This gas amounted to 6.25 cubic feet, and when burnt at the rate of five cubic feet per hour, from an argand burner with fifteen holes, and a 7 inch chimney, it gave a light equal to that of seven sperm candles, each burning at the rate of 120 grains per hour. One hundred parts of the prepared peat therefore furnish:—Of porous charcoal 36, ammoniacal liquor 18.86, thick tar containing paraffine 5.14, and gas of an illuminating power of seven candles 40 parts.

Dr. Letheby sums up his report in these terms:—"The amount of gas is very considerable, (a ton of the material furnishing as much as 14,000 cubic feet of gas,) and although the illuminating power is not very high, yet from the fact that much of the tar and paraffine had actually been rendered gaseous by their passage through a red-hot tube, there is every prospect that they might be still further decomposed, and converted into gases of high illuminating power. The gas, when purified by passing through an alkaline mixture, was found to be entirely free from sulphur; and in this respect it has great advantages over coal gas, for the products of its combustion are wholly harmless in respect of their action on inorganic matter, such as books, drapery, and other perishable fabrics; in its use as fuel, there is no opaque smoke evolved, no sulphurous acid is set free, the heat is quickly raised and quickly diffused, the ashes never clinker so as to choke the bars of the furnace, and that the peat does not contain any metallic sulphuret or other substance that is likely to produce spontaneous combustion. In short, it fulfils most of the conditions which are mentioned by Dr. Lyon Playfair and Sir H. De La Beche in their report as to the requisites for a good fuel."

The Sheffield steel-makers cannot now get a proper supply of Swedish iron even at £38 a ton. We have no substitute for this costly material in our pit coal iron; but we have a remedy in the employment of charred peat. Good British ore, smelted with peat fuel, would most undoubtedly rival the best productions of Sweden, and at a cost which puts comparison out of the question. Mr. Gwynne, indeed, boldly asserts that, with his process of smelting, he can supply iron for the steel-makers at one-half of the price now paid to Swedish houses.

The uniformity in the character of the iron produced by the peat smelting

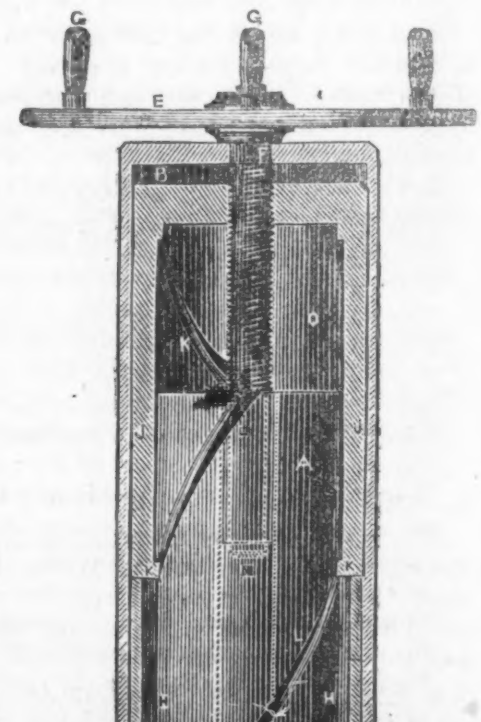
is a great feature in its favor, and besides this, the quality of the metal is fully equal to what bears so high a price as "charcoal iron." What greater inducements could we have for a trial of the peat system?

Mr. Summerhill of Sheffield, has tried charred peat in his charcoal fires, and he finds that, with one ton of the charred but uncompressed Flintshire fuel, he can produce upwards of 2½ tons of "charcoal iron." This iron was made into tin-plate material, weight for weight; charcoal from peat has a greater tendency to make iron "burrow," in comparison with the common system of treatment, and the product is extremely well suited for the wire-drawer. The blast pressure under which Mr. Summerhill worked in the case which we have adduced, was 2½ pounds. If we have so excellent a smelting material lying in abundance before us, we shall have ourselves seriously to blame if we neglect its very evident application.—*Pract. Mech. Journal, London.*

IMPROVED STEERING APPARATUS.

FIGURE 1.

FIGURE 2.



THIS remarkably neat and compact steering apparatus, is the invention of Capt. Charles F. Brown, of Warren, of Rhode Island, who has taken measures to secure a patent for the same.

Figure 1 is an elevation of the apparatus, and figure 2 is a vertical section.

The neatness of the apparatus is observable at a glance; it combines compactness with the great power of the screw and inclined-plane. The outside is composed of a hollow pillar, B, fig. 1, bolted to the deck. E is the horizontal wheel, with its handles, G G. This wheel is secured on a strong screw-rod F, which forms its axis. It passes freely through the collar of the hollow pillar, and works into a thread collar in a hollow tube or metal cylinder, J J. This cylinder is made with two feathers, H H, on its outside, to slide in two vertical grooves in the inside of the pillar, B, to guide the cylinder J J, steadily up and down, as it is made to slide thus when the screw is turned by the wheel. This cylinder, J J, has two spiral flanges, K K, extending on each side from top to bottom, on the interior, O. The rudder post P, has a metal top, A, firmly secured to it, and made of a somewhat greater diameter than the post below. This head of the rudder post has two spiral grooves, L L, cut around it, into which the spiral flanges, K K, of the sliding cylinder fits. The head, A, of the rudder post has an interior hollow part, M, represented by the dotted lines, in which the screw-rod, F, turns, but does not touch. The screw acts only upon the thread of the collar of the sliding cylinder, J J, raising it and depressing it, as the wheel is turned, and when it is raising or falling, the flanges, K K, acting in the grooves, L P, of the head of the rudder post, turns it with great power to steer the vessel. On fig. 1 there is a small slit, N, at the bottom of the hollow pillar, in which is a pointer F, attached to the rudder post, which turns so as to indicate the degrees through which the rudder has moved. A dial can be secured before it, with the degrees marked out on it. This is a very beautiful arrangement of itself. For compactness and neatness, we have seen no steering apparatus, to equal it. It has been highly approved of by all nautical gentlemen who have seen it.

More information may be obtained by letters post-paid, addressed to Capt. Brown, who is a gentleman of great mechanical ingenuity.

HOLYHOCK PAPER.

James Niven, *Keir, Dunblane.—Patent dated November* 10, 1854.

Mr. Niven here puts forth the claims of one of the many plants which grow luxuriantly, and with little cultivation, in all parts of the British islands, as a cheap raw material in substitution of the rags used in the manufacture of paper. The present invention, in fact, relates to the application or employment and use of the plant commonly known as the Hollyhock, or Rose-Mallow—that is to say, the plant which, in the botanical classification of Linnæus, is the Althæ Rosea Monodelphia Polyandria, and is comprehended under the natural order "Malvaceæ," or of plants of the genera "Malva,"—in the manufacture or production of pulpy material from which paper is to be made, as well as in the manufacture or production of fibrous materials for textile purposes. The invention, as regards both these uses, applies to all the many varieties of the hollyhock plant, or the order "Malvaceæ," but more obviously and particularly to the ordinary large garden hollyhock. The stems of such plants furnish large quantities of long fiber of great tenacity, which fiber, when duly prepared, is most excellently suited for the preparation of a pow-

erfully cohering paper pulp, as well as for use in textile manufactures. Being a perennial rooted plant, the roots are also largely available for the production of strong fiber. In adapting the stems of such plants to the manufacture or production of paper pulp, the plant is used either in a green or dried condition; it is preferred, however, to operate upon the stems immediately, or soon after the plants are cut or pulled in the ordinary manner of gathering and removing such plants. When the stems are removed from the earth, they are first of all steeped in water for a term of six or eight days, more or less, the practical duration of such steeping being regulated and governed by the actual resultant effect of the water; that is to say, the steeping is continued until the pure and valuable fiber will freely separate from the ligneous or woody portion of the stems.

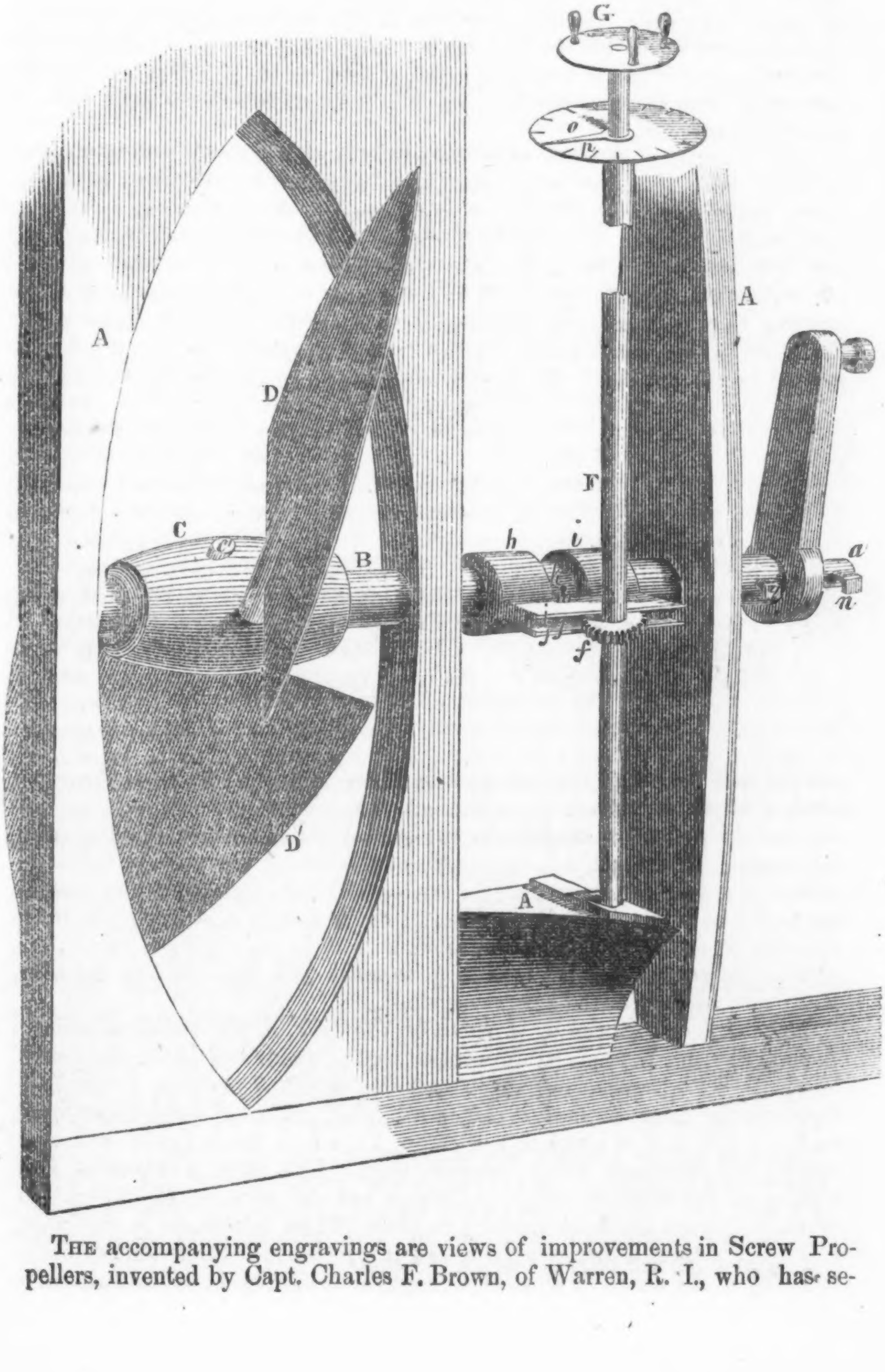
At this stage of the process of manufacture, the stems under treatment are removed from the water or "steep," and they are then submitted to the action of any suitable mechanical arrangement for the purpose of beating or breaking them up. This breaking up may be effected in the general manner commonly pursued in the primary breaking of the flax plant, so as to disintegrate the fibers and break off the woody or ligneous portions of the stem. It is not, however, essentially necessary to remove the ligneous portions, as it has been found that the whole of the stem is fitted for being reduced to a pulp. During, or subsequent to this disintegrating process, the mucilaginous or gummy matter, with whatever aqueous matter is present in the stems, is washed clear away, either by pure water, or by an acdulous solution, or by any other economical and effective cleansing agent. When the stems are thus fully reduced or disintegrated, the ligneous waste portions are removed, and the resultant fibrous mass is spread out in the open air, where the sun's rays can act upon it to bleach and dry. When so bleached and dried, the fiber may be stored away for subsequent use. In making paper from the fiber so prepared, the fibrous mass is bruised or broken down in any suitable mechanical apparatus, and it is then chopped or finely divided by any suitable cutting instrument. The reduced mass is then soaked in water, and worked up or macerated in the usual manner, as pursued in the ordinary manufacture of paper from rags, for the production of a pulpy mass suitable for the use of the paper maker. The pulp so made is capable of being used in the manufacture of paper, either alone or unmixed, or it may be commingled with other materials already in use in the paper manufacture. When the pulp is obtained, the subsequent routine of its manufacture into paper is similar to that pursued with the ordinary rag pulp, or it may be varied as the properties of the fiber may suggest.

In the application of the hollyhock stems to the manufacture of textile materials, the fibers prepared in the manner just described, are subsequently treated according to the existing textile processes; such processes, for instance, as are adopted in the flax manufacture. Being strong and of good staple, this fiber is particularly well suited for being prepared, spun, and woven into cloth. And it has been found, that the roots of the plants are also well adapted for the production of a remarkably strong fiber. Hence, in manufacturing practice, so often as the crop of plants grown for the purpose requires renewal, the roots are to be taken up and prepared for the obtainment of fiber, both for the manufacture of paper and for textile purposes. When taken from the ground, the roots are macerated and reduced, and the farinaceous matter contained in them being removed, the resultant fiber is employed in the manner already pointed out, but more particularly for the manufacture of paper.—*Pract. Mech. Journal, London.*

IMPROVEMENT IN SCREW PROPELLERS.

PATENT GRANTED JULY 12, 1855.

FIGURE 1.

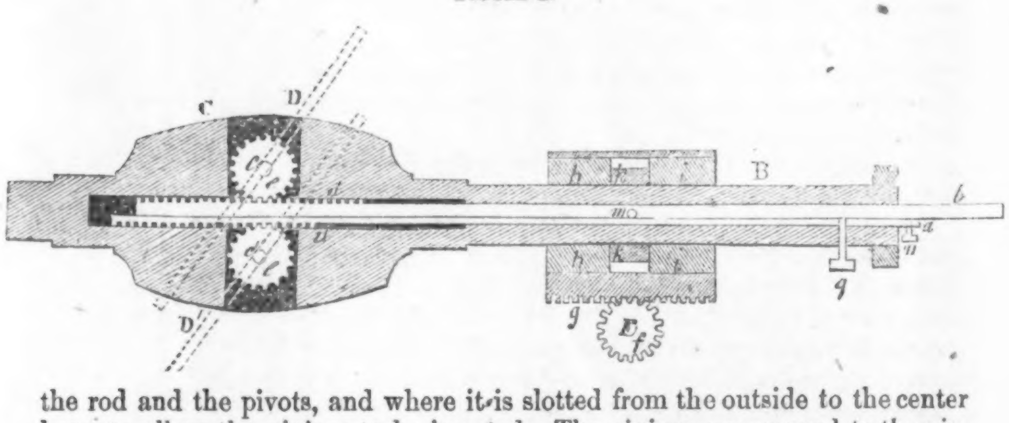


THE accompanying engravings are views of improvements in Screw Propellers, invented by Capt. Charles F. Brown, of Warren, R. I., who has se-

cured a patent for the same. Figure 1 is a perspective view, showing the propeller, rudder, and part of the frame of a vessel at the stern. Fig. 2 is a horizontal section taken through the axis of the propeller. The same letters of reference indicate like parts. This invention relates more particularly to that description of screw propellers which has its blades adjustable in the hub, for the purpose of altering the pitch of the screw, and for bringing the blades to a position to offer no material resistance to the progress of the vessel when under sail. Another principle of the improvement consists in so operating one of the blades, that, when brought into a proper position, and the revolutions of the propreller stopped, it will act as a rudder, in case of the vessel's rudder being disabled, and it will therefore serve to steer the vessel when under sail.

A A is the framing of the vessel, in which are the bearings of the propeller shaft, B. C is a hub on the shaft; this shaft is bored from the front end nearly to the back end—the bored part extending through the hub; in this bore is fitted a rod, *a b*, which is furnished at that part passing through the hub with a rack, *d*. The hub is also bored transversely, to receive the pivots, *c c'*, of the propeller blades, D D'; these pivots are not radial to the hub, but pass through it at equal distances from the axis on opposite sides to it. Each one of the pivots carries a small toothed pinion, *e e*, gearing into the rack, *d*, on the rod, *a b*. The hub is solid except where it is bored to receive

FIGURE 2.



the rod and the pivots, and where it is slotted from the outside to the center bore, to allow the pinions to be inserted. The pinions are secured to the pivots, and the pivots are confined in the hub by the pinions or by other suitable means. If the rod, *a b*, be moved longitudinally, the rack, *d*, turns the pinions, *e e*, and by this means, the blades, D D,' are brought to any position either in line with or parallel to the axis of the screw, or at any pitch or inclination in either direction, so as to make a right or left hand screw; the pinions are geared with the rack so as to make each blade occupy the same position in relation to the axis of the shaft.

The rod, *a b*, is moved by a person on the deck of the vessel, as follows: A vetrical shaft, F, is placed in suitable bearings near one side of the propeller shaft—its upper end reaching above the deck and carrying a wheel, G. Opposite the propeller shaft it carries a toothed pinion, *f*, which gears into a rack, *g*; this rack is attached to a collar, *h i*, which fits to, but is capaple of moving longitudinally on the propeller shaft. This collar is prevented from turning on the shaft by flanges, *j j*, above and below the rack, which embrace the pinion and keep the rack in gear. There is a recess in the collar, *h i*, which divides it into two parts, and in this recess is fitted another collar, *k*, fitting to the shaft, B, so as to be capable of sliding on it, but this collar

is made to turn with the shaft by a pin, *m*, passing through it and the shaft, and through the rod, *a b*; a slot in the shaft allows the pin to move longitudinally, by turning the wheel, G, the pinion, *f*, is made to move the rack, *g*, longitudinally; and the collar, *h i*, moving with the rack actuates the collar, *k*, while the pin, *m*, moving with the said collar, actuates the rod, *a b*, and causes the rack to turn the pinions, *e e*; this can be done either while the propeller is revolving or while it is stationary. A dial, O, is placed upon deck, and a pointer, *p*, on the shaft. F, indicates the position of the blades. This is seen on deck, and is a very convenient arrangement for setting the blades.

The rod, *a b*, so far as it has been described in its relation to the adjustment of the blades of the propeller, may be considered a single rod, but for the purpose of using the blade of the propeller as a rudder, it (the rod) is divided longitudinally into the two parts, *a* and *b*, which are held together by a screw-bolt, *n*, at the front end when the propeller is in use. The part *a* of the rod carries that part of the rack which gears with the pinion, which is on pivot *c* of the blade, D, and the part *b* carries that part of the rack gearing with the pinion on the pivot *c*,' of blade D.' The blade, D, is the one which is intended to serve for a rudder; and, for that reason, that portion *a*, of the rod is made larger than the other, and for another reason, viz., when the other blade is not in use, it is necessary for the pin, *m*, to work clear of the other part, *b*. The first thing to be done to use the blade, D, for a rudder, is to bring the said blade, D, to a vertical position downwards, and this is done by stopping the engine in a proper position. The blade, D,' is then secured in its place above the other one by a set screw, *q*, which passes through the shaft, B, into a recess in the part *b*; of the rod. The screw-bolt, *n*, is then loosened from that part, *a*, of the rod, which is thus left free to be moved independently of the other part, *b*, of the rod, thus enabling one of the blades to be used for a rudder in an emergency.

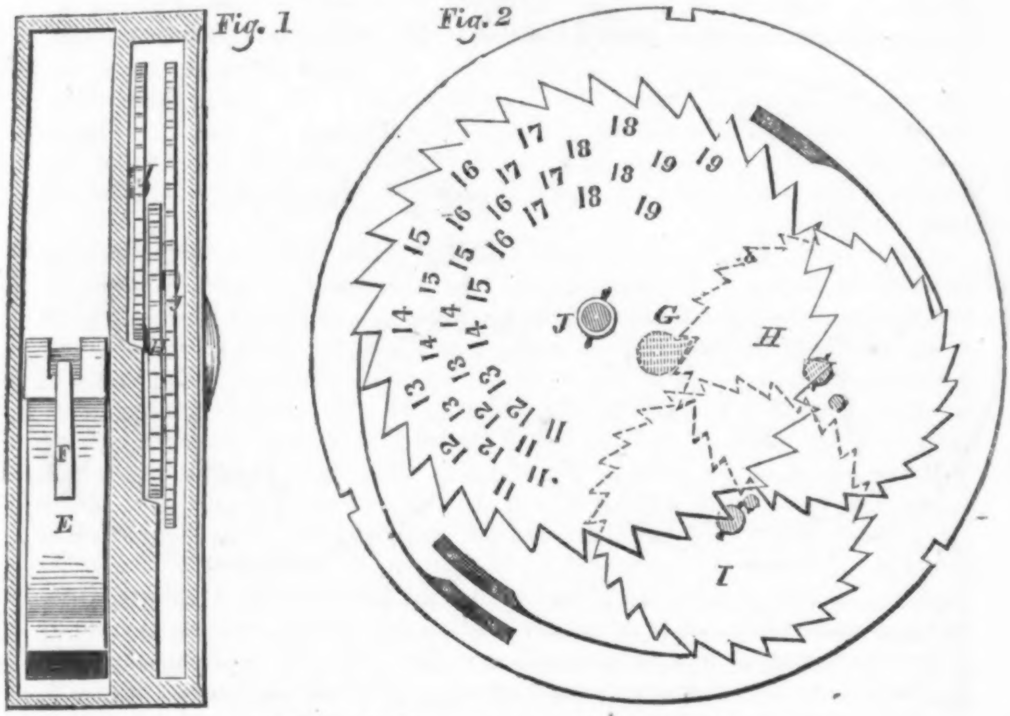
The superiority of this mode of arranging and adjusting the blades, consists chiefly in the depth of bearing, or socket obtained for the pivots of the blades, by fitting them through the hub. The common arrangement is to make the pivots, *c c*, radial, and to turn them by bevel gearing—that is, in arrangements of adjustable blades; this prevents their being carried through, and requires the hub to be hollow to receive the gearing. This arrangement is therefore more compact, and far stronger, according to the dimensions of the parts. The steering improvement, in many cases, may be the means of saving a vessel, as in a case like the Helena Sloman.

THE sixth annual meeting of the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF EDUCATION will be held in the chapel of the New-York University on the 28th, (Tuesday,) 29th, 30th, and 31st of August, 1855. The Introductory Address will be given by Alexander Dallas Bache, LL.D., the retiring President.

PRINCES' PROTEAN PEN.—We again call attention to this new pen. It pleases us much. We seldom sit down to write an hour at a time without using it. We should be very sorry to be deprived of it.

One form is for the pocket, and another is for the desk. The former may be carried in the pocket, full of ink, and without risk to a white vest.

Fig. 1 Fig. 2



IMPROVED ROAD MEASURE.

The annexed figures represent a new odometer for measuring the distance which a carriage travels, invented by F. S. Coburn, of Ipswich, Mass., who has taken measures to secure a patent.

Fig. 1 is a full sized edge view of the odometer. Fig. 2 is an inside view showing the toothed wheels. Fig. 3 is a view of the odometer weight, E, and fig. 4 is the dial of the odometer. This small instrument may be attached to a carriage in fifteen minutes. A cover slides over the dial, which cannot be opened without a key. It is made to turn with the hub of the carriage. The cost is trifling, and the manufacture may be a source of considerable profit to the mechanic, and a great security to the keepers of stables and others. In the inside of this odometer, which is a small box, the weight, E, is suspended on a stud or small shaft, and it will be observed that it always hangs perpendicularly while the odometer revolves with the axle. Upon this principle of action the whole of the wheels are operated. On the small stud on which E is hung, is the ratchet wheel in fig. 3, into which the ratchet, F, takes, which moves one notch every revolution, but the ratchet, F, by passing over the teeth of the small wheel, fig. 3, when the carriage is backing, allows the weight to move freely, and consequently there is no registering. The motion imparted in one direction by the weight to the shaft, G, moves the wheel, H, fig. 2, one tooth every revolution of the odometer, and every revolution of wheel, H, moves the wheel, I, (which should be set with its ratchet in a contrary direction,) one tooth, and this wheel, I, moves the one, J, which is the dial plate, and an opening in the case, fig. 4, shows it with the miles marked out. The dial is divided so as to be applied to wheels of different sizes. This odometer is small and neat; the figures represent one of full size which has been used repeatedly. It will be observed

that the wheels are simply moved on the clock-work principle of gearing to reduce the revolutions from the first to the last, which registers the miles; the whole operations being dependent upon the suspended balance weight E. The instrument is neat and simple, and is very convenient. There are but

Fig. 3

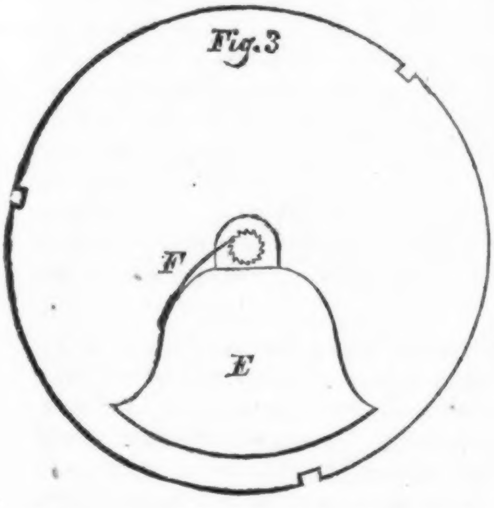
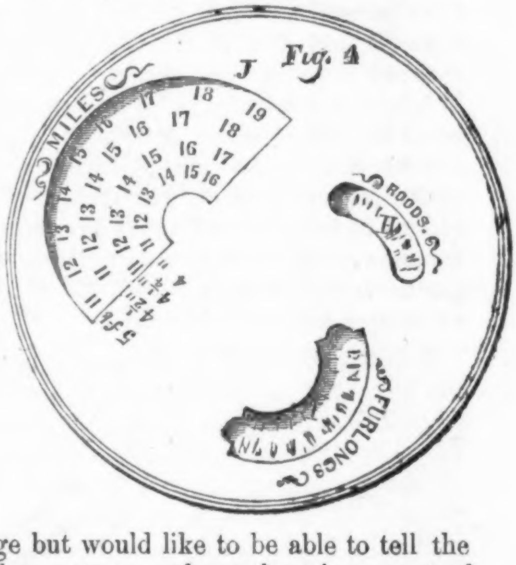


Fig. 4



few persons who go out with a carriage but would like to be able to tell the distance they have traveled when they return, and yet there is no way of doing this but by such an instrument. With turning to the one side and the other on a road—turning out and turning in on the track—the mile stones are no guides for indicating the distance traveled; the odometer alone is the true tell-tale. An odometer is the same as the tell-tale on the steam-engine, without which no steamship navigates the ocean. We hope such instruments will soon come into more general use.

More information about this one may be obtained by letter addressed to Mr. Coburn at Ipswich.

AMERICAN PATENTS.

Gwynne's Centrifugal Pump for Raising Sunk Ships.—The following letter from the owners of a ship sunk in the Missouri is good practical testimony to the value of this pump for the heavy work of raising vessels: "The Ironton struck a large submerged rock on the Missouri river, eighty-five miles above St. Louis, last month, and filled in about forty minutes, and sunk in about ten feet water. She was somewhat listed, and one guard and part of her deck was just out of water, while the other guard had some three or four feet of water over it. We sent one of our steam diving-bell boats (the '*Submarine*, No. 6,) to the wreck, where she arrived on Sunday, at dark. The next morning, while part of her crew were adjusting the suction-hose, (twenty-one inches in diameter,) our carpenters curbed off the hatches, and by 10 o'clock A. M., steam being up, we started the pump, and *in less than ten minutes* the water was so low that the suction-pipe took air, the water being only seven or eight inches deep on her floor timbers. The pump kept the

water down until the carpenters succeeded in bulk-heading or partitioning off the break in her hull, and before dark the Ironton was safely floating. Steam was raised on her, and she was brought down to this city, where she has been docked. The pumping engine used on this occasion was one of your pattern, called B. No. 3; and some idea of its power may be inferred from the fact, that we did not stop the break at all in her hull before we pumped the water out of her. The dock showed the damage to be crushing in her larboard knuckle for twenty feet. The planks were completely shattered for this distance, and about thirty inches in width; and every timber, futtock, and her knuckle kelson in this space, were broken in. The tonnage of the Ironton is about one hundred and fifty tons. We estimated the discharge of the pump at about five hundred barrels per minute. The stream from it was ten inches deep, thirty-four inches wide, and ran at the rate of ten miles per hour, as we ascertained by a light paddle-wheel made for the purpose.—EADS & NELSON."

MACHINE-MADE WATCHES.—Some five years since, Messrs. Howard & Davis, in connection with Mr. A. L. Dennison, commenced a branch of this business in Roxbury, and though the most serious obstacles were in the way, they have persevered, slowly gaining knowledge by experience, and slowly attaining the object of their desires. The want of machinery, and the inexperience of laborers, have been great drawbacks; but they have gradually overcome these, and have now every convenience for the successful prosecution of their business. Their establishment in Roxbury was so surrounded by dusty localities, that it was found impossible to obtain perfection in works which were liable to this inconvenience, and a location for a building was therefore selected in Waltham, which is most admirably adapted to the purpose. The building, occupying a third of an acre, is a curiosity in itself, for it is the first structure erected in this vicinity of the "gravel wall," or "concrete material," which has been brought to public notice by Mr. O. S. Fowler. The concrete consists simply of limstones and sand, mixed as we do mortar, and then, by a simple process, piled up in layers, which becomes hard, and in the lapse of years is as solid as stone. The building, thus constructed at an expense of one-third of what it would cost to erect a brick edifice, and which is comparatively fire-proof, has stood the cold of the present severe winter, and established, beyond a doubt, its adaptability to ordinary uses. The manufactory at Waltham is a two-story building, built in the form of a square. Mr. Dennison, assisted by Mr. Stratton, superintends the works, and a twelve-horse engine furnishes the motive power for the machinery, heats the entire building, and carries from the river water into the reservoir, which supplies every part of the building with water. The different departments are separated, and each gang of mechanics has a distinct portion of the watch to manufacture. In one room the plate is cut, in another the jewels are reduced to a proper size, while the second hands, minute hands, the jewel screws, the wheels, the springs, the cases, the engraving, and the polishing, require each a distinct process, in which different classes of operatives are engaged. The operatives number at present about fifty, a quarter of whom are females, who are found well adapted to the business, and it is a fact worthy of note, that these American watches are the product of American operatives. In Locle, and other Swiss towns, where watches are made, the parts are manufactured in the cottages of the workmen, and are then carried to head-quarters, and put together; little machinery is used; here under one roof the watch is completed, by the aid of machinery, and less skilful hands. In a few months, when under full blast, at the strike of each hour, it is expected that

a watch will be finished, that is, twelve per day. The cost, of course depends upon the style of the cases; those in gold will range, at retail, from 75 to 100 dols., and those in silver, from 30 to 40 dols. The Company intend manufacturing large quantities of watches of the hunting style. Parts of watches, screws, hands, wheels, are also neatly put up on cards, and are much sought after by the trade.

THE "LONDON" LOCOMOTIVE ABOVE NIAGARA.—The great subject of conversation in the West just now, is the passage of the "London" locomotive over the gorge of Niagara, and the name of the great metropolis was never in prouder remembrance than when borne, as now upon the fabric that testified almost man's highest excellence in bold art. The bridge settled just half an inch when the locomotive was at the center, for the brave men who controlled the starting bar paused in the very mid-river. Thus arriving at the line where the state and the colony meet, the flags of the two nations were waved, the scarlet and the blue fluttering in the exultation of those who there did homage to the blended sovereignty. The bridge is built so that it rises arch-like in the center. The deflection was no greater than was anticipated. There are two tracks—indeed, three, on the bridge; the 4-8½ of the New-York Central, the five feet of the Great Western, and by a fifth rail the New-York and Erie (continued by the Canandaigua road) also can transport freight or humanity over. There were six passengers or persons on this boldest of all locomotives, and by a measure of justice seldom wrought out in bold enterprises, all were represented, as well the man who furnished the means as he who produced the skill necessary. There is a good omen in the fact, that the crossing was first done from the Canada side over to the American, the sons of St. George will feel justified at grouping the two recollections, that, as an English steamer first made regular communication across the sea, it was an English locomotive that has first made this thrilling transit over the Gulf. Far away beneath, so far that the heavy wave scarce shows its swelling, rushed the Niagara, and the shrill shriek of triumph the "London" sent forth as it passed over the chasm was heard beyond the cataract itself.

THE AMERICAN PAPER MANUFACTURE.—There are in the United States 750 paper mills in actual operation, having 3000 engines, and producing in the year 270,000,000 pounds of paper, which is worth at 10 cents per pound, $27,000,000 dollars. To produce this quantity of paper 405,000,000 pounds of rags are required, 1¼ pounds of rags being necessary to make one pound of paper. The value of these rags at 4 cents per pound is 16,200,000 dollars. The cost of labor is 1¾ cent upon each pound of paper manufactured, and is therefore 3,375,000 dollars. The cost of labor and rags united, is 19,575,000 dollars a year. The cost of manufacturing, aside from labor and rags, is 4,050,000 dollars, which makes the total cost 23,625,000 dollars of manufacturing paper, worth 27,000,000 dollars. We import rags for this manufacture from 26 different countries, and the amount in 1853 was 22,766,000 lbs., worth 982,837 dollars. Italy is the greatest source of supply, being more than one-fifth of the whole amount, but the supply has been gradually falling off every year. From England we imported 2,666,005 pounds in 1853. The cost of imported rags has been as follows:—1850, 3 61-100 cents; 1851, 3 46-100 cents; 1852, 3 42-100 cents; 1853, 3 46-100 cents. The consumption of paper in the United States is equal to that of England and France together.—*Boston Post.*

ENGLISH PATENTS.

Protection of the Westminster Palace from Lightning.—The Parliamentary estimates for the year contain a charge of £2314 for securing the new houses of Parliament from lightning, backed by a very able report on the subject by Sir W. Snow Harris. That great authority on this important subject very clearly and properly exposes the popular error of attributing an attractive power to lightning-rods. It is proved by a most extensive induction of facts, and a large generalization in the application of metallic conductors, that metallic substances have not exclusively in themselves any more attractive influence for the agency of lightning than other kinds of common matter; but that, on the contrary, by confining and restraining the electrical discharge within a very narrow limit, the application of a small rod, or wire of metal to a given portion of a building is in reality highly objectionable. Besides, the application of an ordinary lightning-rod is of a very partial character. It has small electrical capacity, and is very often knocked to pieces by heavy discharges of lightning. Last June, Ealing church was struck by lightning; the small conductor attached to the tower was partially fused, and damage ensued. So again, in July, a church at Astbury was struck, and the small conductor fused in several places, the discharge dividing on the body of the church, and displacing and shivering several stones. In Her Majesty's navy, conductors of this description have been repeatedly knocked in pieces by lightning.

To secure such a building as the new palace at Westminster against lightning, Sir Snow Harris considers it requisite to complete the general conductibility of the whole mass, and so bring it into that passive or non-resisting state which it would assume in respect of the electrical discharge, supposing the whole were a complete mass of metal. By this means a discharge of lightning, in striking upon any given point of the building, would have, through the instrumentality of capacious electrical conductors, unlimited room for expansion upon the surface of the earth in all directions, to which, by a law of nature, the discharge is determined. In fact, what is called lightning is the evidence of some occult power of nature, forcing a path through substances which offer greater or less resistance to its progress; such, among the former, as atmospheric air, vitreous and resinous bodies, dry vegetable substances, and such like. In the case of such bodies, a powerful evolution of light and heat attends its course, together with irresistible expansive and disruptive force, by which the most solid and compact structures are rent asunder; whereas, in finding a path through substances which offer comparatively little resistance to its course, this explosive form of action, which we call lightning, becomes transformed into a harmless and unseen current. Hence the great protective influence of a capacious and general system of conduction, such as that just adverted to, which does not restrict the discharge to a given partial and narrow path, but is so circumstanced that lightning, striking anywhere upon buildings, cannot enter upon any circuit, of which the large capacious lines of conduction do not form a part.

Miles' Hydrostatic Railway Brake.—The Shrewsbury and Hereford Railway has just been the scene of an interesting trial of this invention under the auspices of several eminent railway authorities and men of science. The testing train left the Shrewsbury station at 12.30, arrived at the city at 2.40

stopping at the usual stations on its way. The patent break alone was used during the journey, and upon the arrival of the train at this station, a number of experiments were tried upon different portions of railway, principally to ascertain the distance and time in which a train could be arrested. Notwithstanding the usual drawbacks to working all new inventions, the train was easily stopped, when going forty miles per hour, in 300 yards, the usual distance with the ordinary brakes being about 1750 yards. Colonel Kennedy and other gentlemen, who tried these tests, expressed a strong opinion that, with the slight enlargement of the tender cylinder, pointed out by Mr. Miles, a train would be stopped with ease in three yards to the mile; that is to say, a train going forty miles an hour would stop in 120 yards. The experimental train left this city, with the usual mails and passengers, at 6.45, and arrived at Shrewsbury at 9.15, using the patent brake during its course, still proving itself most effective. The brakes themselves are upon the usual principle, but are placed upon every carriage, instead of on one or two only. A cylinder is fixed under the carriage, 4½ inches diameter and 3 inches stroke; and in this cylinder is fitted a solid piston, the rod of which is attached to the lever of the brake. Into each side of the cylinder is screwed an iron tube, one inch in diameter, and terminating, at each end of the carriage with a joint of a novel character. When the carriages are connected, the tubes are made continuous by inserting into these joints a flexible tube between each carriage; and when the engine is attached to the train, that is also connected by a flexible tube, leading into tubes fixed in the bottom of the tender, which tubes are merely for the purpose of reducing the temperature of the water used in applying the brakes. The boiler is fitted with a stop-cock near the starting lever, and from this cock is a tube connected to the tubes in the tender. When a train is made up, and the engine attached, a cock inside the tender is opened, and the tubes throughout the train are allowed to fill themselves with water; water being only compressable to the extent of one inch in 15,000, is always ready to be acted upon at the moment. At the present day, locomotives are worked at a pressure of from 100 to 150 lbs., per square inch; but for example's sake, we will take the lowest figure, therefore, with the cylinders before described, a power of 1500 lbs. is given to each brake, no matter what may be the number of carriages in the train. The cylinder to work the tender brake is 4½ inches diameter, with a 6 inch stroke and gives a force of 3000 lbs. The mode of bringing the brakes into use is this: The engine driver shuts off his steam, opens the cock named in boiler, and in one second, the whole of the brakes are on the wheels, and are taken off by the driver shutting the cock in the boiler, and opening the one in the tender.

Scott's Elastic Action Three-Wheel Brougham.—Mr. Michael Scott, C. E., who has devoted considerable attention to the perfecting of the details of vehicular contrivances—more especially the parts relating to the springs and bearings—has submitted to us a plan of "three-wheel Brougham," of very suggestive character. This carriage is designed for affording superior facility of motion, with ease and accommodation to the occupants, and means of resisting the wear and tear of traffic. It has two wheels behind, and a single central wheel in front, as high or even higher than the hind pair. This lightens the draught and simplifies the under frame-work. The driver's seat occupies the place usually assigned to the rumble, directly over the hind wheels, so that the reins stretch over the body of the carriage, as in the Hansom. This obviously leaves the front view quite open and free. In arrang-

ing the details of the bearing actions, Mr. Scott uses a "semi-circular spring" the extreme end of which, together with the spring blocks, are wholly disconnected—producing great elasticity. His "elastic nave, is also a further means of obtaining an easy action. The mortice beds, or the portions on which the inserted wooden spoke ends bear, are cushioned with India-rubber. India-rubber is also used for encircling the felloes of the wheel, either in strips as an independent tyre, or in small blocks or cushions between the wooden felloe and the ordinary metal tyre. The inventor has contrived to elasticate various other rigid parts of the carriage, even the axle itself, as well as the shoes of the horses.

The French Beet Sugar Manufacture.—There are now at work in France 208 beet sugar manufactories, being fewer by 95 than were in operation last year at the same time. The quantity of sugar manufactured, including 7,870,605 kilogrammes, lying over since 1854, was 43,229,798 kilogrammes, or 30,921,340 less than last season; and that sold for consumption, or deposited in the Government bonded stores, 39,659,690 kilogrammes, being a falling off of 23,591,362 kilogrammes.

Purifying Rancid Oil.—It has recently been discovered in France, that nitric ether, commonly known as "spirits of nitre," has a powerful effect in clearing and deodorising impure oils. A small quantity mixed with the crude oil carries off all the disagreeable odor, whilst, by subsequently warming the oil so treated, the spirituous ingredient is renewed, and the oil becomes sweet and limpid. A few drops of nitric ether added to the contents of an oil bottle, will act as a constant preventive to rancidity.

Logan's Portable Winch for Shipbuilders.—This winch is constructed so that it can be fixed in any position, and may be adjusted with facility to the work to be performed. To this end the winch is formed with a sole plate of malleable iron, and is fitted upon an under sole plate, upon which it turns by means of a swivel joint. The under sole plate is formed with clamps, or bent ends, by which it can be hung upon any fixture, as the frames, plates, or other part of a ship, or of a boiler, or other structure. The whole apparatus can be carried by one man, and can be moved along the plates, or other part on which it is hung, at pleasure. The two sole plates are formed with regularly pitched holes, arranged so that those in one plate may be brought fairly opposite to those in the other. Thus, on the winch being adjusted, it can be fixed in position by means of pins passed through the holes in the two plates. This apparatus will be of great utility in the construction of iron ships, boilers, and all other structures in which heavy weights have to be lifted and moved about. Thus the winch can always be conveniently placed, and the tackle can be fixed immediately over the plate, frame, or other article to be lifted, whilst it is immaterial in what position the winch is fixed, as the swivel joint arrangement gives it the power of accurately adjusting itself to the work it has to perform.

Locomotive Expenses and Statistics.—The total cost of locomotive power, including repairs, on the Caledonian Railway, is 8d. per train mile, and including the working repairs of waggon and carriage stock, 10-08d. per train mile. The average number of engines in steam during the past half-year has been 90, and the number of train miles run, 8,532 per day. The average number of engines in working order has been 118, repairing 20, and renewing 7, together 145. The passenger trains averaged 7-19 carriages, and the goods trains 22-65 waggons.

NEW BOOKS.

Sabbath Morning Readings on the Old Testament. Book of Leviticus. By Rev. John Cumming. Boston: John P. Jewett & Co. 1855.

Our readers know the high estimate with which we regard the works of this learned divine. The volume before us is not exceeded in its interest by any of its predecessors. It is just the thing for Sunday-school teachers and Bible classes.

Sabbath Evening Readings on the New Testament. St. Luke. By the same.

This is a full, plain, practical exposition of the Gospel, as the former volumes we have described are of the Pentateuch. No Sabbath-school teacher should be without it. It is also just what is wanted in our "mutual classes," which, by the way, ought to be multiplied a hundred fold.

These books are for sale by Jewett & Proctor, Cincinnati; and Sheldon, Lamport & Blakeman, New York.

The New-York Quarterly. July, 1855. Jas. G. Reed, Publisher.

We seldom see this work, but what we have seen gives us a desire to see more. The articles in this number are well written, judicious, instructive and entertaining. What more is to be desired? We commend it to the reading community as one which they should sustain for their own sakes. It is devoted to Science, Philosophy, Literâture and the interests of our united country, and is recommended by the most eminent literary gentlemen of New-York. Terms, $3 a year; 4 copies, $10.

Harpers' New Monthly for August

Is on our table, in anticipation of its issue, and is elegantly executed and numerously illustrated. The topics are of unusual interest.

Doesticks. What he says. By Philander Doesticks, P. B. New-York: Edward Livermore. 1855.

This republication of newspaper articles "claims nothing," says the "manufacturer," and "amounts to nothing;" "some are bad, some are worse." The author is essentially correct, though there are now and then genuine scintillations of wit, and many good strikes of true humor. But like "Hodge's razors, it was made to sell."

Putnam's Monthly for August.

This is a very good number. The contents are as follows: Turkish Wars of Former Times, My Lost Youth, The Bell Tower, Unknown Tongues, (The Language of Animals,) About Babies, Life among the Mormons, The River Fisheries of North America, (The Artificial Propagation of Fish,) Cape Cod, First Friendship, Living in the Country, Sir John Suckling, Twice Married, (Continued,) The Armies of Europe, Editorial Notes, etc., etc, American Literature and Reprints. Dix & Edwards, Publishers, 10 Park Place.

Household Words for August, by the same publishers,

Is just what is wanted for an after-dinner book.

The Knickerboker

Is also on our table; an old friend to whose calls we have not been accustomed of late. We greet him as a highly esteemed and well-established friend, of high literary merit, and well deserving a prominent place among the standard literary works of the day.

It is edited still by the able and popular writer, Louis Gaylord Clark. Published by Samuel Hueston, 348 Broadway.

NEW MUSIC.

Wm. Hall & Son have an unusual proportion of pieces of a high order in their late issues. Among the songs that we have especially noticed, are

Sweet Kate of Norton Vale. By Geo. Simpson.

The music is very sweet, and the words by Edward Farmer as good as they can be, coming from a lover who has lost his heart.

Come Haste thee Home. Ballad by A. C. Farnham.

Music not very unlike the former in its general character, and equally good.

I Want a Wife; or, the Bachelor's Invitation. Melody by Wallace, adapted to words of Clarence Rawlings by Chas. Jarvis.

Why is it that bachelors can't write their own words, but have to go to spinsters for this service in such circumstances?

Hope on, hope ever. By Chas. Jarvis, to words of L. W. Glenn.

A very pretty song, with a very pretty little chorus to it.

Among the instrumental pieces are

Maria Polka Mazurka. By Joseph Archer. Very fine. And Meyer Polka, fantasie, by Leopold de Meyer. Quite as good in its way; and both quite easy for those of only tolerable skill on the piano-forte.

List of Patents Issued

FROM JUNE 5, 1855, TO JULY 3, 1855.

Wm. Adamson, of Philadelphia, improvement in sand-paper cutting machines.

E. Allen, Worcester, improvement in fire arms.

A. C. Billings and B. H. Ruggles, Palmer, Mass., improved mode of riveting shingles.

Addison P. Brown, Brattleboro, self-regulating wind-mills.

Ephraim Brown, Lowell, burglar's alarm.

Adolph and Phenix Brown, New-York, machine for boxing and turning wood.

Gardner A. Bruce, Mechanicsburg, Ill., improvement in harvester reels.

Sylvester Colburn, Ansonia, Conn., improvement in grain and grass harvesters.

Julius C. Dickey, Saratoga Springs, improved mill steps.

Robert D. Dwyer, Richmond, Va., improvement in attachments for lightning rods.

Edmund Field, Greenwich, Conn., improvement in locking latches for doors.

Geo. Finley, Collins Township, Pa., improvement in machines for washing sand.

Thomas Fowler, Cohoes, improvement in knitting machines.

Charles Folson, Cambridge, Mass., improved book clasp.

H. H. Fultz, Lexington, Miss., improved horse power.

Jacob Harshman, Dayton, O., improvement in steam boilers.

Isaac R. Hartwell, Woodstock, Vt., machine for cutting cavities spherical, elipsadiol, etc.

James D. Hayes, Mt. Morris, Ill., improvement in lard lamps.

Edmund Hayes, Wheeling, and Morgan Hayes, Washington, Pa., improved apparatus for setting boxes for carriage tops.

Birdsill Holby, Seneca Falls, method of regulating the issue apertures, and of suspending turbine wheels.

Wm. H. Hovey, of Springfield, Mass., improvement in grain and grass harvesters.

M. G. Hubbard, New-York, method of hanging plane stocks and their mouth pieces.

Friedrich W. Hoffman, and Chas W. Gustay, Fordham, New-York, improvement in machines for making rivets.

James and Wylie Littie, Princeton, Indiana, improvement in attaching the connecting bar to the cutters of harvesters.

John Loudon and Otto Ahlstrom, New-York, improvement in screw fastenings.

Jean Pierre Molliere, Lyons, France, improvement in sewing machines. Patented in France, May 30, 1854.

Milo Peck, New-Haven, improvement in trip-hammers.
Paul Peckham, Petersham, Mass., machine for dressing conical tapering surfaces.
Samuel Rockafellow, Goatsville, Pa., improvement in mowing machines.
John J. Rollow, Fredericksburg, improvement in machines for shucking and shelling corn.
A. H. Rowand, Alleghany City, machine for feeding sheets of paper to printing presses.
Edmund Q. Smith, Cincinnati, method of cutting straight or curved mortices.
Wm. Stinson, Georgetown, Pa., improvement in corn planters.
Samuel T. Thomas, Lawrence, Mass., improvement in looms.
Hiram Tucker, Cambridgeport, improvement in spring bed bottoms.
T. J. Van Benschoten, Poughkeepsie, improvement in horse collar blocks.
John U. Wallis, Dansville, N. Y., improvement in paddle wheels.
Nicholas Whitehall, Attica, Ind., improvement in plows.
Geo. B. Wilson, Elizabeth, Pa., improvement in cooling and drying flour.
Robert Wilson, Columbus City, Iowa, improvement in apparatus for heating feed water to steam boilers.
Robert Wilson, Columbus City, Iowa, improvement in sewing machines.
Edward Brown, Waterbury, Conn., assignor to the Scoville Manufacturing Company, of same place, machine for beveling and polishing the inner edges of daguerreotype fac plates, or "mats.
Wm. McDonald, New-York, assignor to R. Hoe & Co., of the same place, machine for mitreing printers' rules.
James Curtis and Samuel Hoard, Chicago, Ill., water metre.
Augustus M. Clover, Waterborough, S. C., improvement in cotton presses.
John Power, Boston, cork machines.
George W. Stedman, Vienna, N. J., improvement in sewing machines.
Thomas Silver, Philadelphia, improvement in marine steam engine governors.
Thomas C. Clarke, Camden, N. J., filter.
Thomas C. Clarke, Camden, N. J. hydrant filter.
Chas. M. Day, N. Y., feed motion for saw mills, etc.
George L. Dulany, Mount Jackson, Va., improvement in mill bushes.
Elisha Fitzgerald, New-York, improvement in buoys for raising sunken vessels.
Calvin Fletcher, Cincinnati, improvement in supplying furnaces with hot air.
Wm. S. Ford, N. Y., improvement in window sashes.
Wm D. Greenleaf, Washington, N. H., improvement in fastening scythes to snaths.
Florian Hesz, Cincinnati, improvement in bedsteds.
M. J. Kennedy, Fallston, Pa., machine for joining staves.
John C. Kine, Pittsburgh, improvement in door locks.
James J. McComb, New-Orleans, improvement in arrangement of bumpers for self-acting bar brakes.
Fred'k Newbury, Albany, improvement in revolving fire arms.
Isaac M. Newcomb, Eden, Vt., sewing machine.
Jos. H. Penny and Thomas B. Rogers, New-York, improvement in propellers. Patented in England, June 14, 1853.
John Plumbe, San Francisco, improvement in cutting clay into bricks.
Edgar A. Robbins, Rochester, method of tuning accordeons.
Geo. H. Swan, Bridgeport, stave machine.
Orson W. Stow, Planstville, Ct., improvement in sheet meltal folding machines.
Edward A. Sterry, Norwich Town, Ct., faucet.
Henry W. Smith, Boston, improved coupling for organs and melodeons.
Christopher Sharps and George E. Adriance, Hector, tenoning machine.
Jos. C. Silroy, New-Orleans, improvement in door locks.
Hosea D. Searles, Rockford, Ill., improvement in guard rails of railroads, to be used with pronged cow-catchers.
Samuel Taylor, Petersham, Mass, improvement in plank roofs for buildings.
Wm. R. Thompson, Cleveland, improvement in heating wrought iron wheels for forging.
Nathaniel Waterman, Boston, portable floating filter.
Sheldon Warner, Enfield, Mass., curvillinear sawing machine.
Wm. D. Beaumont, Mobile, improvement in artificial fuel.
Wm. Gee, New-York, improvement in soda water generators.
Aug. M. Glover, Waterborough, S. C., improvement in the buckets of paddle-wheels.
John Grout, Hocking City, Ohio, improved self-acting cotton press.
Geo. King, Farmville, Va., improvement in pressing tobacco in plugs.
Jos. Montgomery, Lancaster, Pa., and James Montgomery, Baltimore, improvement in wheat fans.
Joan Pierre Molliere, Lyons, France, improved machine for cutting the edges of boot and shoe soles. Patentee in France, January 5, 1854.
T. J. W. Robertson, New-York, improvement in sewing machines.
Isaac M. Singer, New-York, improvement in sewing machines.
Chas. R. Webb, Phila., improvement in wind-mill.
Charles De Saxe, New-York, assignor to Thos. H. Bate, same place, improved surpentine spinner to catch fish.
Joel G. Northrop, Syracuse, assignor to James G. Mather, same place, improvement in printing presses.
Orson C. Phelps, Boston, assignor to Orson C. Phelps and John Holton, same place, improvement in metalic medium for filtering.
Joshua Turner, Jr., Charlestown, Mass., assignor to Asa Bennett, Boston, Mass., and Warren Covell, Debham, Mass., machine for ruling leather.
Caleb H. Griffin, Lynn, assignor to Caleb H. Griffin, and George W. Otis, same place, improvement in machine for cutting out boot and shoe soles.
John M. Wimley, Philadelphia, assignor to J. A. Shaw, same place, improvement in attaching gutta percha soles to boots and shoes
Jos. Adams, Fairhaven Vt., improvement in stone sawing machines.
Horatio Allen, New-York, two motion con valves.
Avery Babbett, Auburn, machine for cutting irregular forms.
Uriah Bebee, Oakland, Mich., improvement in corn planters.
Henry Boynton, Hinesburgh, Vt., reciprocating railway propeller.
John H. Cocke, Bremo, Va., improvement in railroad car seats.
S. Park Coon, Milwaukee, improvement in apparatus for replacing railroad cars upon the track.
Richard F. Cook, Troy, Ala., improved fish hook.
L. G. Evans, Spring Hill, Ala., improvement in plows.
Jas. P. Fennell, Philadelphia, improved coal screens.

Geo. Fetter and Jos. L. Pennock, of Holmesburg, Pa., machine for cutting the inside hole of shovel handles

Arasmus French, Waterbury, Ct., improvement in springs for hinges, etc.

Abram C. Fanston, West Philadelphia, improvement in scaffolds.

Robert R. Gray, Crawfordsville, Ind., improved expanding block for horse collars.

Stephen Gorton and Francis Morris, Crawford county, Pa., improved stump machine.

Geo. W. Hildreth, Lockport, improved mode of hanging bells.

Orris C. Hill, Malone, improvement in doors.

Robert M. Kerrison, Philadelphia, improved piano forte action.

John L. Kite, Philadelphia, improved hot air furnaces

Joseph H. Marston, Philadelphia, apparatus for taking stereoscopic protographs.

Felix Miller, New-York, improvement in fastenings for carpets.

Jeans Pierre Molliere, Lyons, France, improved machine for cutting leather into strips, for boot and shoe soles and heels. Patented in France, July 22, 1853.

Jonah Newton, New York, method of scouring cutters to rotary dises.

Royal Parce, Pitcher, N. Y., machine for cutting locks and tapering ends of wooden hoops.

W. D. Parker, New-York, improved ice-house.

David Pierce, Woodstock, Vt., machine for manufacturing wooden ware.

David and J. R. Pollack, Lancaster, Pa., fan blower.

Lovell T. Richardson, Worcester, socket handles for chisels.

John Richardson, Buckeyestown, Md., improvement in producing intermittent acceleration of motion, in harvesters, rakes, etc.

Harrison D. Reynolds, Pendleton, Ind., improvement in cleaners.

John W Russell, Springfield, Mass., improved chuck for turning escentrics.

James Selby, Lancaster, Ohio, improvement in seed drills.

Albert S. Southworth and Josiah J. Hawes, Boston, apparatus for moving stereoscopic pictures.

Sylvester Stevens, Boston, improvement in rotary engines.

Peter Ten Eyck, New-York, improved self acting brake for vehicles.

William Thompson, Nashville, self-operating circular gate.

Levi Till, Sandusky, improved brick.

Charles F. Thomas, Taunton, improvement in steam boilers.

Albert M. Waterhouse, New-York, improvement in hose couplings.

Alva Worden, Ypsilanti, improvement in joints for stove pipes.

Jesse N. Bolles, Philadelphia, assignor to H. J. Ockerhausen, Baltimore, improvement in joints of pipes for artesian walls.

George L. Dulany, Mount Jackson, Va., assignor to Reuben Allen, Shenandoah county, Va., improved mill dress.

Thomas Hodgson, Brooklyn, assignor to Rob't L. Wright, New-York, improvement in the manufacture of artificial stone. Patented in England, May 9, 1854.

Abram and Chas. N. Clow, Port Byron, improvement in corn shellers.

Marvin S. Otis, Rochester, assignor to Charles Rumley, of same place, improvement in machine for boring cylinders.

Isaac H. Steer, Winchester, Va., assignor to Henry Carter, Pittsburgh, improvement in making nuts. Ante-dated December 19, 1854.

Wm. and Wm. F. Boyd. Watertown, Mass., improvement in bridle winkles.

Chas. B. Bristol, Naugatuck, Conn., improved wrench.

Martin Croke, New-York, improvement in weather strips for doors.

Henry Clayton, Dorset Square, England, improvement in brick and tile machines. English patent Dec. 13, 185?.

Daniel N. Zanzack, Salem, Mass., improved mode of hanging window sashes.

Samuel Eakins, Philadelphia, improvement in ice pitchers.

Moore R. Fletcher, (late) of Concord, for tidal alarm apparatus.

Jonas S. Halsted and Cornelius J. Ackerman, New-York, for carpenter's mitre and bevel square.

Chas. S. Harris, Holyoke, for balance valve.

A. V. Hough, Green Castle, Ind., improvement in brick machines.

Chas. H. Johnson, Boston, improved in gas burners.

R. A. L. McCurdy, Sabine Parish, La., improvement in cotton gins.

Peter Moody, Indianapolis, improvement in horse collar blocks.

Isaac M. Wade, Clinton, Mich., improvement in churns.

Wm. Wiler and Lucien Moss, Philadelphia, improved gas-lighter.

Moses D. Wells, Morgantown, Va., improvement in seeding machines.

Bernard O. Bryan, Marietta, Pa., improvement in machines for cleaning ore.

Henry Peckham, King's Ferry, improvement in staw cutters.

Abraham Powell, Jr., Mare Island, Cal., improved fuse stock for bomb shells.

Elisha E. Rice, Hallowell, Me., improvement in railroad car brake.

Alfred A. Starr, New-York, improved adjuster of window blinds.

Lafayette Stephens and Solomon B. Elithrop, Elmira, improvement in window blinds, doors, etc.

Joseph Sykes, Mercer, Pa., for wheelwrights' guide mandrel.

Chas. Taylor, McKeesport, Pa., improvement in machines for cutting grain, grass, etc.

Reuben H. Thompson, Buffalo, improvement in hand machines for making boots and shoes.

John H. Tuck, Pall Mall, England, improvements in packing for stuffing boxes.

Thos. Champion, Washington, D. C., improved steam boiler furnace.

Stephen Hull, Poughkeepsie, improvement in attaching the raker's seat to harvesters.

John H. Manny, Rockford, Ill., improvement in the cutters of harvesters.

John H. Manny, Rockford, Ill., improvement in the guard fingers of harvesters.

Oren Stoddard, Busti, N. Y., improvement in corn planters, to be operated by hand.

Jacob Lenneff, Philadelphia, improvement in machines for making harness for looms.